Breast cancer surgery Principles

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Surgery in Breast Cancer: The HUNDRED year challenge

1917

Radical Mastectomy

2017

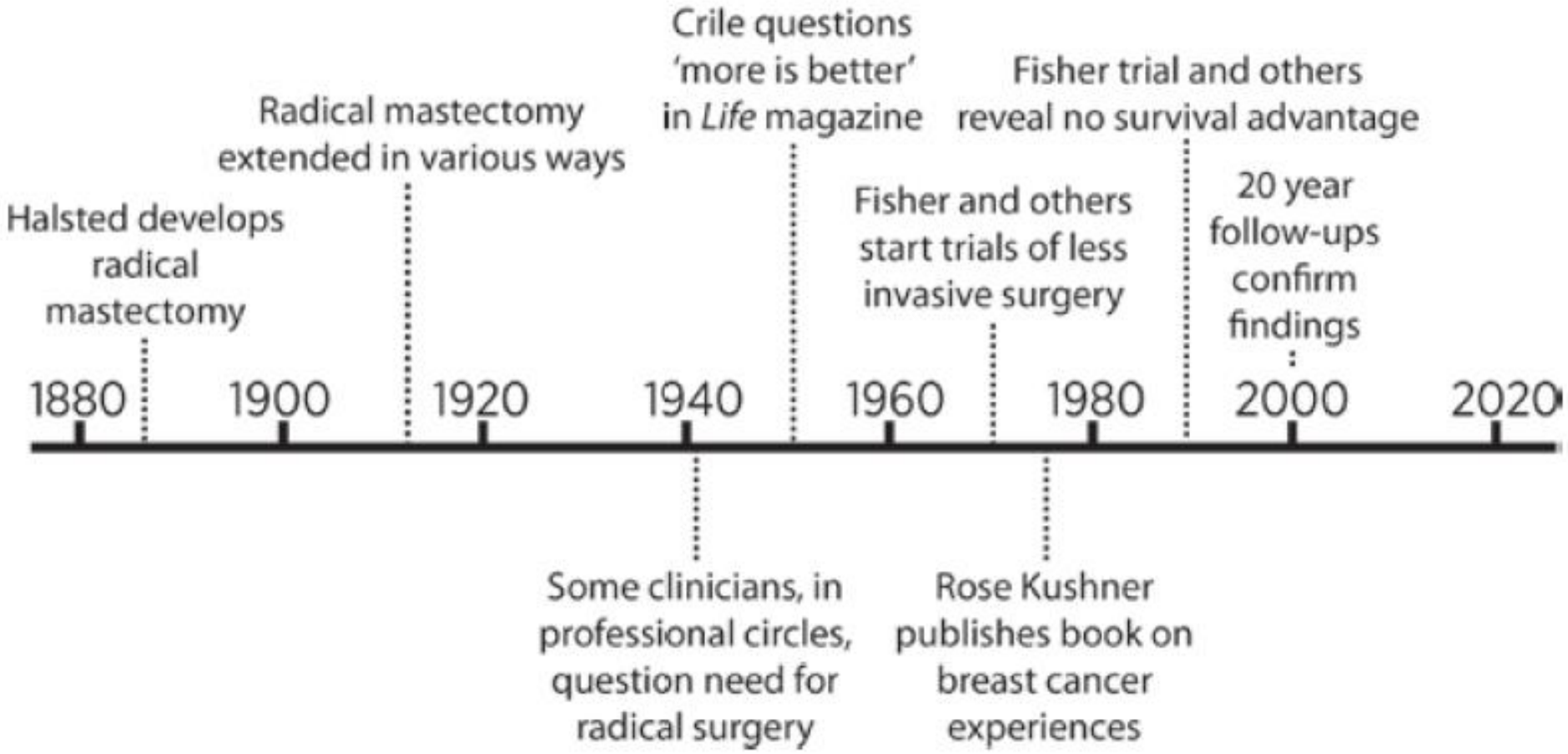
Nipple sparing mastectomy

Breast Conservation therapy

What this talk is about

- The evolution of Surgery
- Mastectomy
- Breast Conservation
- Oncoplastic Breast surgery
- Surgical management of Axilla

The Evolution of Breast Cancer surgery



The Era Of Mastectomy

Halsted Concept

What is Halsted Mastectomy?

- Breast + NAC + tumor
- Skin over breast
- Pectoralis major & minor
- Axillary nodes I,II,III.

✓ Reconstruction by Skin Graft

✓ Poor cosmesis

✓ Promising Survival as first definitive Surgical procedure with sound principles.

Do we need Halsted Mastectomy?

- LABC Pectoral fixity (not T4a)
- T4a tumors(?) needs a staging MRI before surgical decision
- Recurrence breast cancer

- But…Morbidity and outcome needs to be considered.

The followers of Halsted

- Extended mastectomy
- Super radical Mastectomy
- Forequarter disarticulation

- ALL ABANDONED

Crile….Criticized !!##*??

The Dubious Case for Conservative Operation in Operable Cancer of the Breast

THOMAS J. ANGLEM, M.D., ROBERT E. LEBER, M.D.

examination, to have axillary nodal disease. We believe strongly that there does not exist anywhere in the surgical literature evidence to suggest that any other method of dealing with this disease is as effective as surgical dissection of the involved nodes, nor do we believe that there is any valid evidence to suggest that the surgical removal of axillary nodes, whether or not involved by cancer, has any deleterious influence on the patients immunity or resistance to the future progress of any residual disease which may be present in other areas.

urgery of the New England
spital and the New England
pital, Boston Massachusetts

d radical mastectomy as
ised by most surgeons to
ot our purpose to present

When less is More..the era of Modified radical mastectomy

- Standard of Care
- Structures removed

✓ Breast + NAC+Tumor

✓ Skin overlying Tumor

✓ Pectoral fascia

✓ Level I,II,III nodes

The First Papers to favor Conservation..

THE PROGNOSIS OF CARCINOMA OF THE BREAST IN RELATION TO THE TYPE OF OPERATION PERFORMED.

D. H. PATEY AND W. H. DYSON.

From the Middlesex Hospital, London, W. 1.

Received for publication January 21, 1948.

TABLE I.—*Cases With Axillary Glandular Involvement.*

	Standard radical.	Modified radical.
Total cases traced	24	22
Alive and well	2 (6 and 11 yrs.) 1 (alive and well 4 yrs. then lost trace.)	6 (3 to 7 yrs.)
Alive with disease	1 (11 yrs.)	1 (6 yrs.).
Died operation	1	1
Died other causes	1	1 (4 yrs.).
Died disease	18 (6 months to 7 yrs.)	13 (1 to 8 yrs.).

Patey DH, Dyson WH. The prognosis of carcinoma of the breast in relation to the type of operation performed. *British journal of cancer* 2(1), 7–13 (1948).

Modified radical mastectomy

- **When is this done ?**

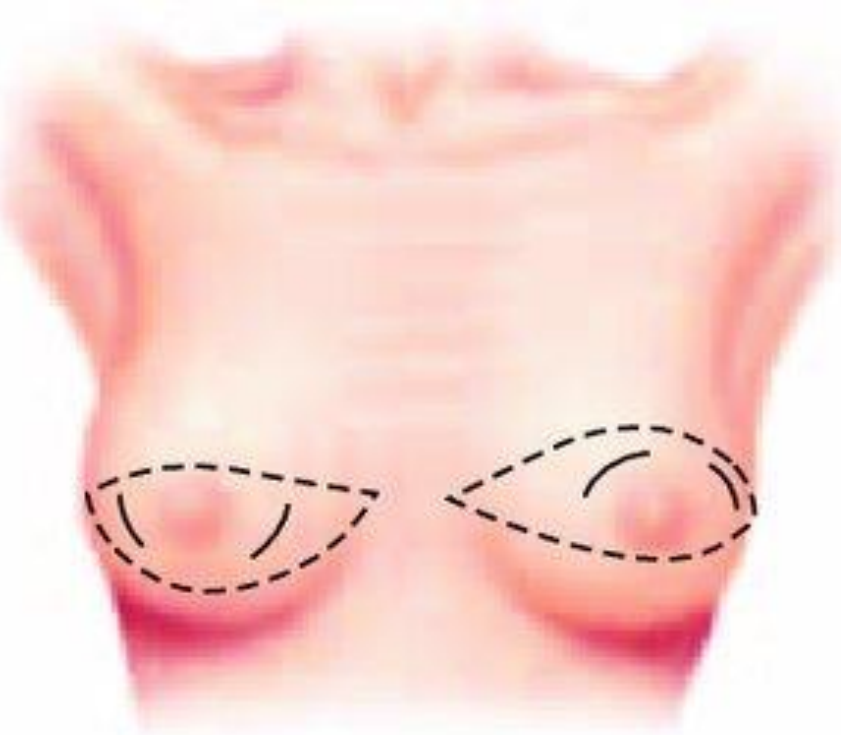
EBC: as alternative to BCT

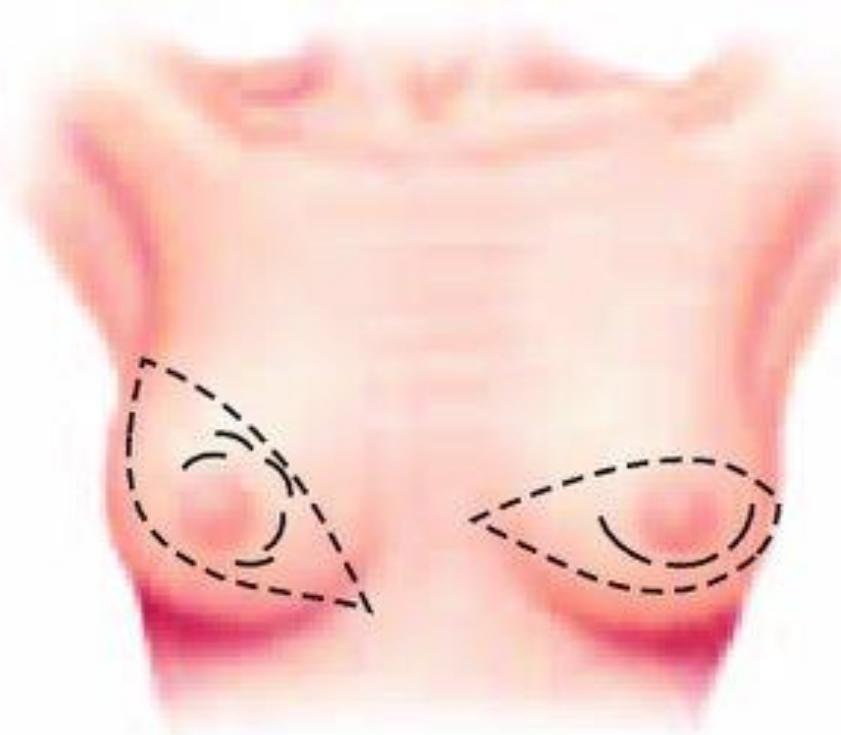
LABC: as standard treatment

ABC: not done

Modified radical mastectomy

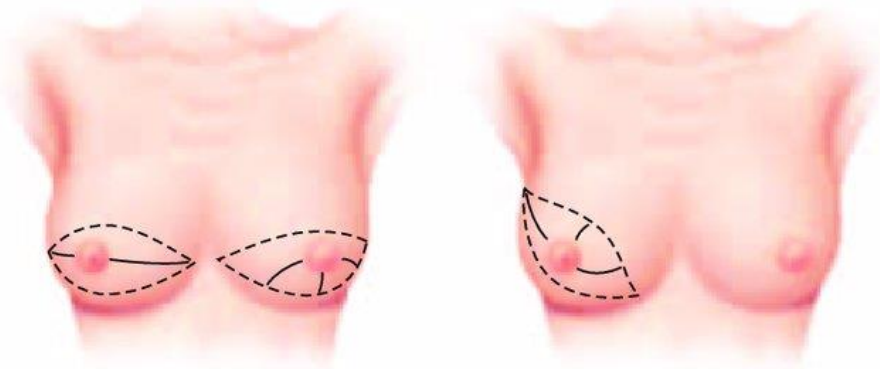
- Incision & Radiation planning



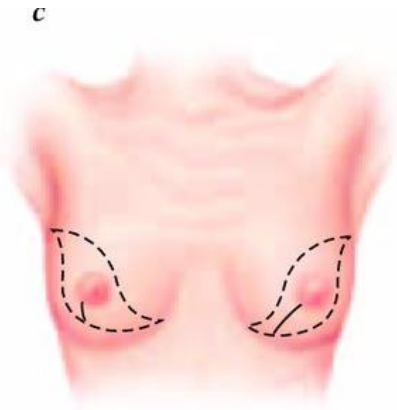


Incison in special situations

Large Breast Women

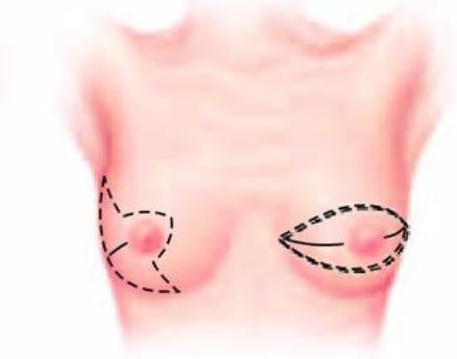


Small Breast women



Post Oncoplastic Procedure

Post Oncoplastic Procedure



A Bad scar

What is skin sparing mastectomy?

Is Skin sparing mastectomy Safe ?

Table 1: Oncological safety of skin-sparing mastectomy for invasive breast cancer – summary of recent studies.

Authors	Year	Sample size	L.R. (%)	F/U (months)	Notes
Slavin et al[10]	1998	51	2.0	45	26 DCIS cases.
Newman et al[8]	1998	372	6.2	26	T1/T2 tumours.
Simmons et al[13]	1999	77	3.9	60	
Toth et al[4]	1999	50	0	51.5	
Kroll et al[9]	1999	114	7.0	72	T1/T2 tumours.
Rivadeneira et al[12]	2000	71	5.1	49	
Foster et al[11]	2002	25	4.0	49	Locally advanced.
Medina-Franco et al[6]	2002	176	4.5	73	
Spiegel and Butler[7]	2003	177	5.6	118	
Carlson et al[5]	2003	539	5.5	65	30.6% DCIS.
Gerber et al[14]	2003	112	5.4	59	
Downes et al[15]	2005	38	2.6	53	'High risk tumours'

International Seminars in Surgical Oncology

BioMed Central

Review

Open Access

Oncological considerations of skin-sparing mastectomy

GH Cunnick[1] and K Mokbel*[2]

What is Nipple sparing mastectomy?

1. Aware of the possibility of loss of form and
function of the NAC.
2. Young, less than 45 years of age.
3. A nonsmoker.
4. Has no prior history of breast surgery or radiation.
5. One for whom adjuvant radiation is not planned apriori.
6. Tumor size is <2.5 cm and is >4 cm from the nipple.
7. Has no documented LVI, axillary lymph nodes or EIC.

Nipple Sparing Mastectomy

ADVANTAGE

1. Scarcity of Terminal duct lobular unit (TDLU) in the nipple permits safe preservation of the tip of the nipple
2. The cosmetic benefit (preservation of body image) following NSM is paramount to a woman's quality of life following breast surgery
3. Decreased surgical procedures on the ipsilateral and contralateral breast and decreased anesthesia risk provide significant patient advantages
4. Innovative intra-operative radiation techniques (ELIOT) may reduce necrotic complications of the NAC thereby permitting NSM in the therapeutic setting
5. There is no difference in overall survival in the event of a loco-regional breast cancer recurrence
6. Surveillance of the reconstructed breast is possible with Mammography and Breast MRI and does not require take down of the reconstructed breast

Nipple Sparing Mastectomy

Disadvantage

1. The oncologic safety and equivalency of NSM has not been defined in randomized controlled trials (RCTs)
2. No defined or standard incision, operative technique or intra-operative assessment of nipple margin has been established
3. There is a high rate of nipple loss and decreased nipple sensitivity following NSM

4. There is a paucity of data regarding the role, dose and timing of radiation therapy prior to or following NSM

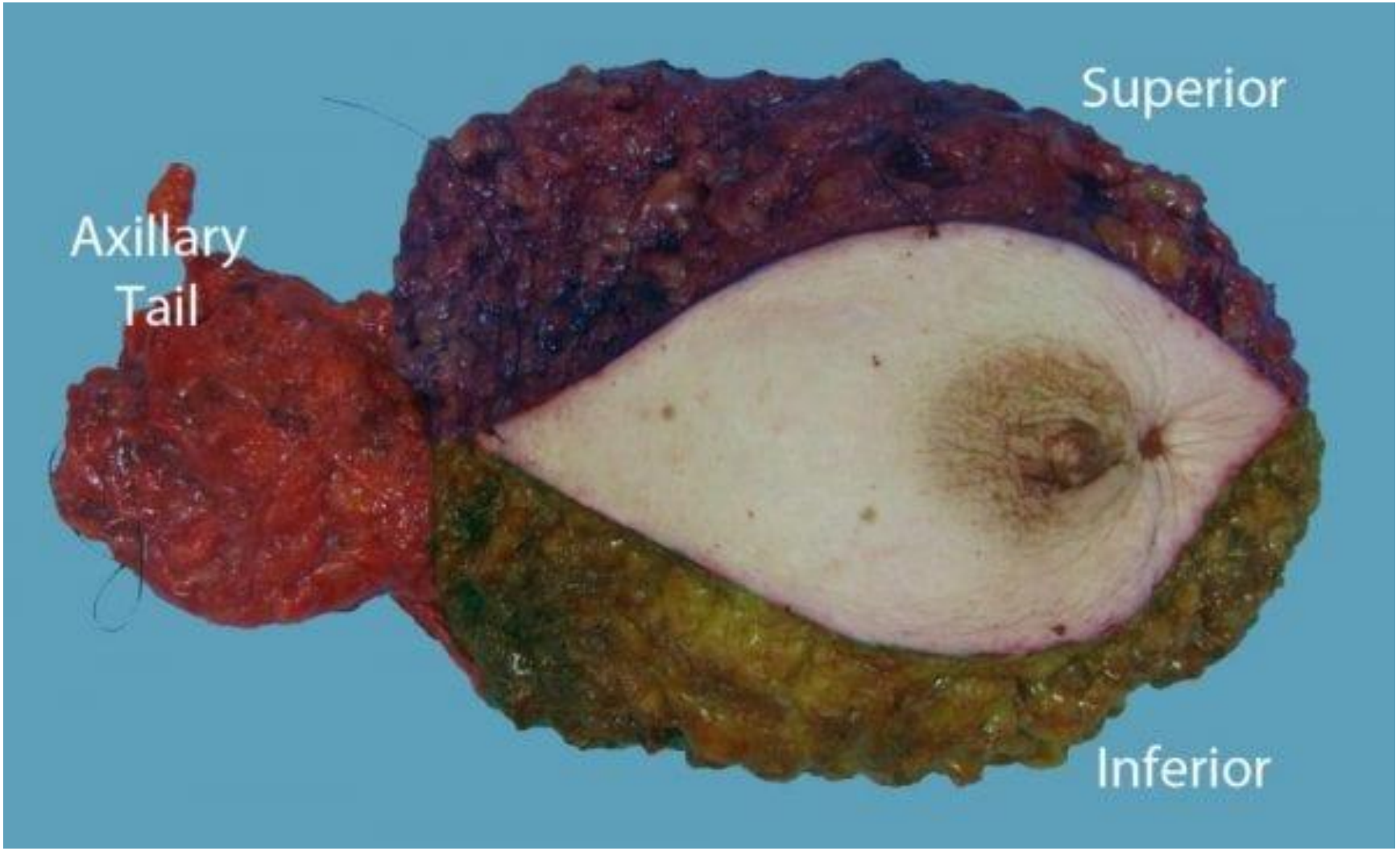
5. The appropriateness of prophylactic NSM in patients with BRCA 1 or 2 mutations is unproven

Specimen of MRM

What to Ask the Surgeon before sending to pathology?

Quality of Surgery
Number of nodes
En block excision
Label/orientation
Preop notes with preop chemotherapy details

A good specimen



Specimen of MRM

- Pathology report: what to expect ***Compare Core biopsy report***

Tumor

- Size(accurate in mm)
- Margins
- Histology
- Grade(BRS)
- Lymphovascular invasion
- Molecular markers **ER,PR,her2neu,Ki67 index.**

Nodes

- Number dissected
- Number involved
- Extranodal extension
- **pTNM**

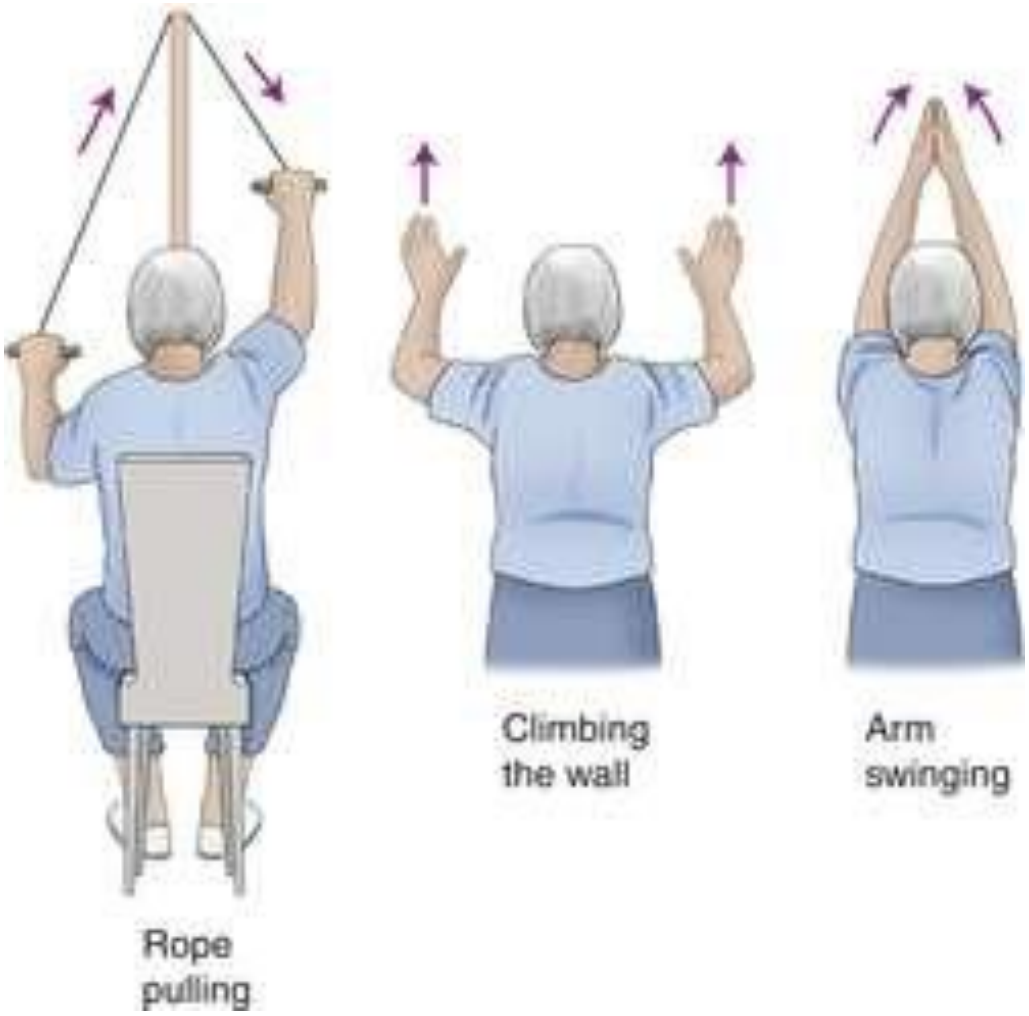
MRM post op care

- 1.Wound care
- 2.Shoulder exercise
- 3.Arm care
- 4.Psychology
- 5.Drains

MRM flap necrosis

MRM drain

Post MRM exercise

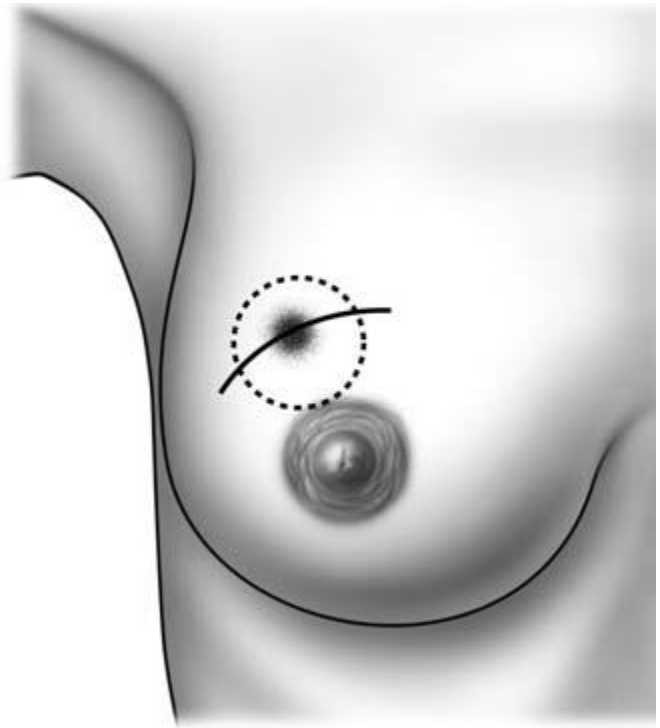


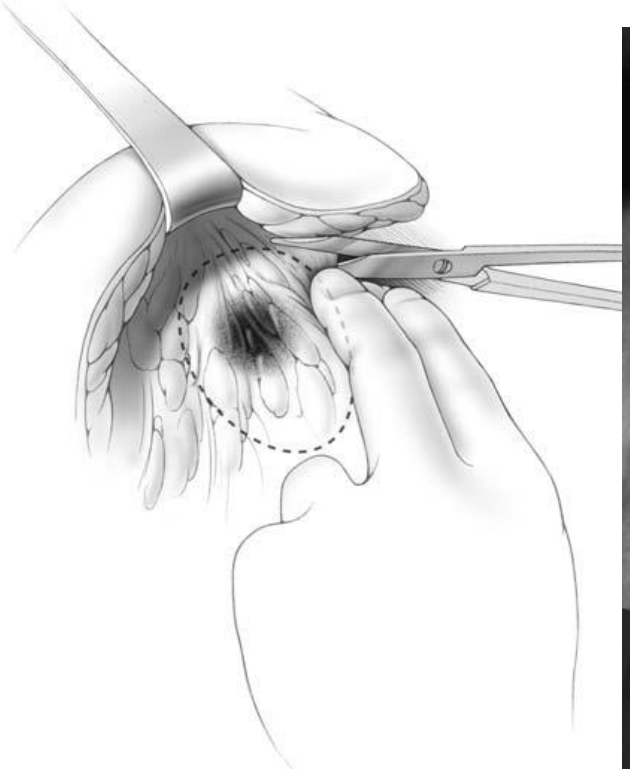
Breast Conservation therapy

- When to do
- When NOT to do
- What is your surgical expectation

Breast conservation Surgery

- Wide local excision
- Margin at least 1 cm macroscopic margin
- Incision planning





No ink On tumor *Consensus*

VOLUME 32 · NUMBER 14 · MAY 10 2014

JOURNAL OF CLINICAL ONCOLOGY

SPECIAL ARTICLE

Society of Surgical Oncology–American Society for Radiation Oncology Consensus Guideline on Margins for Breast-Conserving Surgery With Whole-Breast Irradiation in Stages I and II Invasive Breast Cancer

Meena S. Moran, Stuart J. Schnitt, Armando E. Giuliano, Jay R. Harris, Seema A. Khan, Janet Horton, Suzanne Klimberg, Mariana Chavez-MacGregor, Gary Freedman, Nehmat Houssami, Peggy L. Johnson, and Monica Morrow

Meena S. Moran, Yale University School of Medicine, New Haven, CT; Stuart J. Schnitt and Jay R. Harris, Harvard Medical School, Boston, MA; Armando E. Giuliano, Cedars Sinai Medical Center, Los Angeles, CA; Seema A. Khan, Northwestern University Feinberg School of Medicine, Chicago, IL; Janet Horton, Duke University Medical Center, Durham, NC; Suzanne Klimberg, University of Arkansas for Medical Sciences, Fayetteville, AR; Mariana Chavez-MacGregor, University of Texas MD Anderson Cancer Center, Houston, TX; Gary Freedman, University of Pennsylvania School of Medicine, Philadelphia, PA; Nehmat Houssami, School of Public Health, University of Sydney Medical

See accompanying article on page 1401

A B S T R A C T

Purpose
Controversy exists regarding the optimal margin width in breast-conserving surgery for invasive breast cancer.

Methods
A multidisciplinary consensus panel used a meta-analysis of margin width and ipsilateral breast tumor recurrence (IBTR) from a systematic review of 33 studies including 28,162 patients as the primary evidence base for consensus.

Results
Positive margins (ink on invasive carcinoma or ductal carcinoma in situ) are associated with a two-fold increase in the risk of IBTR compared with negative margins. This increased risk is not mitigated by favorable biology, endocrine therapy, or a radiation boost. More widely clear margins

Breast conservation Surgery

- Surgical expectations
- 1.Pre Operative planning
- 2.Incision planning with surgeon for ABPI/IORT devices
- 3.Cosmetic concerns and outcomes

- Is this the correct patient for BCT?

Breast conservation surgery
Contraindications

- GOAL FOR BCS=<1% RECURRENCE

ABSOLUTE CONTRAINDICATIONS

- ✓ Locally widespread disease;
- ✓ Multicentricity;
- ✓ Diffuse (malignant) micro calcifications;
- ✓ I or II trimester;
- ✓ Patients with mutations on BR-CA1 and 2 genes;
- ✓ Already irradiated thoracic wall.

Breast conservation surgery

Contraindications

Non MOTIVATED PATIENT

Breast Conservation Surgery
4 questions

- 1. Is this Indicated?
- Ans.

“biopsy-proven diagnosis of DCIS or invasive breast cancer clinically assessed as resectable with clear margins and with an acceptable cosmetic result”

THE AMERICAN SOCIETY OF Breast Surgeons - Official Statement -

Performance and Practice Guidelines for Breast-Conserving Surgery/Partial Mastectomy

Breast Conservation Surgery
4 questions

- 2. what are the Absolute contraindications?
- Ans.

Current contraindications for BCS include

a. Early pregnancy

b. Multicentric tumor involving 2 or more quadrants of the breast

c. Diffuse malignant/indeterminate microcalcifications

d. Inflammatory breast cancer

e. Persistently positive margins of excision

THE AMERICAN SOCIETY OF
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Breast Conservation Surgery
4 questions

- 3. what are relative contraindications?
- Ans.

Relative contraindications for BCS include contraindications to RT (prior breast RT, collagen-vascular disease, morbid obesity, and unavailability), very large breast size (sufficient to pose technical difficulty with breast RT), and very large tumor size relative to breast volume. Of note, neoadjuvant chemotherapy may allow BCS for some patients in whom it would not otherwise be possible, including those with second- or third-trimester pregnancy.

THE AMERICAN SOCIETY OF
Breast Surgeons
- Official Statement -

Performance and Practice Guidelines for
Breast-Conserving Surgery/Partial Mastectomy

Breast Conservation Surgery
4 questions

- 4. who Does a BCS?
- Ans.
- “Training in the technique of BCS is part of the surgical curriculum in all accredited training programs”

THE AMERICAN SOCIETY OF
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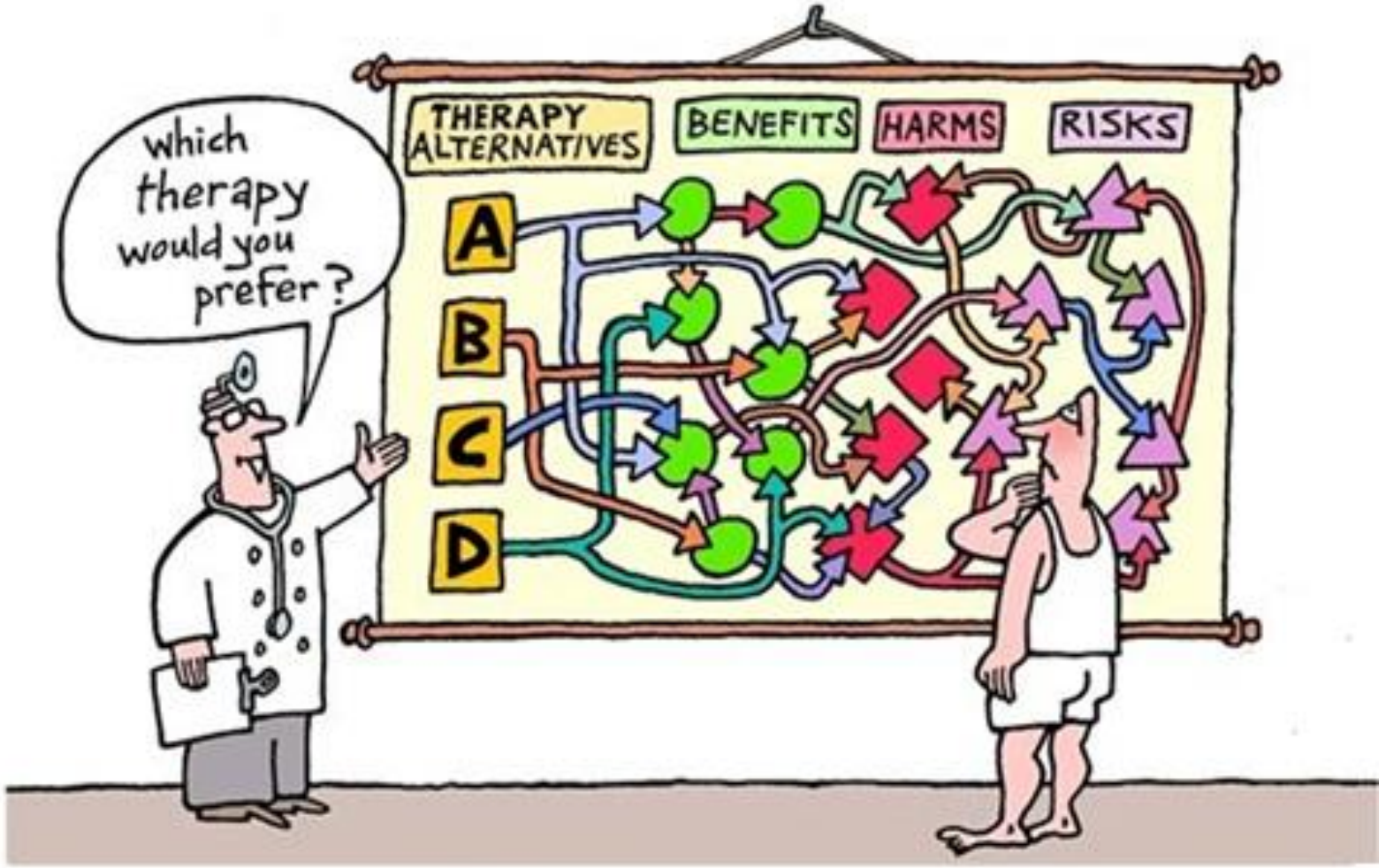
- Official Statement -

Performance and Practice Guidelines for
Breast-Conserving Surgery/Partial Mastectomy

When Does a BCS fail in **cosmesis**?

- Small breast size
- Ptosis breast
- Large body habitus
- Large tumor size
- Central,Medial,Lower quadrant tumor.
- Segmental distribution
- Resection>20% breast volume

Clinical trials that you MUST know..



informed consent

The Origin of **NSABP**

NRG ONCOLOGY

Advancing Research. Improving Lives.™

NSABP

NSABP Members' Area
Password Protected - Access Limited to NSABP Participating Institutions Only

NSABP Foundation, Inc.

General NSABP Information
- Financial Conflicts of Interest Policy
- Coalition Comment: Reconfiguration
- IOM Report Group Comment
- Contact the NSABP
- Pathology Section
- Future Meetings
- NSABP Newsletters
- Media Info on STAR
- Employment NEW

Clinical Trials Information
- Clinical Trials Overview
- Protocol Chart
- Never Say Lost

NSABP®

National Surgical Adjuvant Breast and Bowel Project

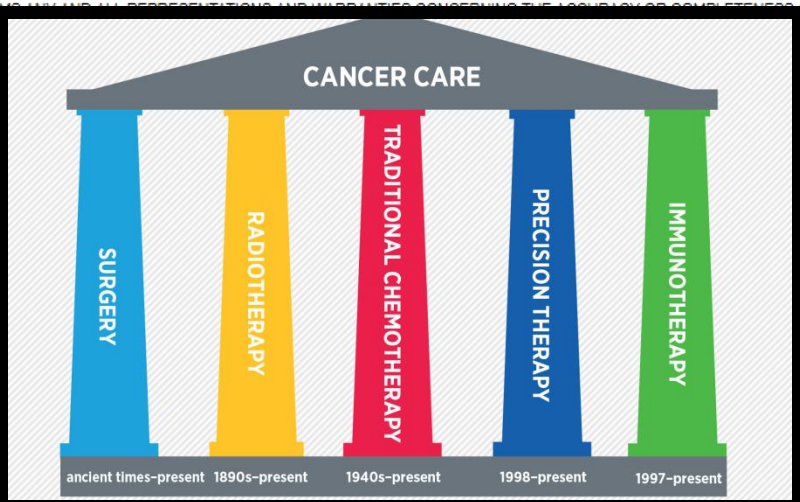
Over 50 Years of Clinical Trial History

The National Surgical Adjuvant Breast and Bowel Project (NSABP) is a clinical trials cooperative group supported since its inception by the National Cancer Institute (NCI). We have a more than 50-year history of designing and conducting clinical trials that have changed the way breast cancer is treated, and, more recently, prevented. It was the NSABP's breast cancer studies that led to the establishment of lumpectomy plus radiation over radical mastectomy as the standard surgical treatment for breast cancer. We were also the first to demonstrate that adjuvant therapy could alter the natural history of breast cancer, increasing survival rates, and the first to demonstrate on a large scale the preventive effects of the drug tamoxifen in breast cancer.

Since its beginning the NSABP has enrolled more than 110,000 women and men in clinical trials in breast and colorectal cancer. We are headquartered in Pittsburgh, Pennsylvania and have research sites at nearly 1000 major medical centers, university hospitals, large oncology practice groups, and health maintenance organizations in the United States, Canada, Puerto Rico, Australia, and Ireland. At those sites and their satellites, more than 5000 physicians, nurses, and other medical professionals conduct NSABP treatment and prevention trials. Their presence at local hospitals and medical facilities means that state-of-the-art clinical trials can be provided to patients near their homes.

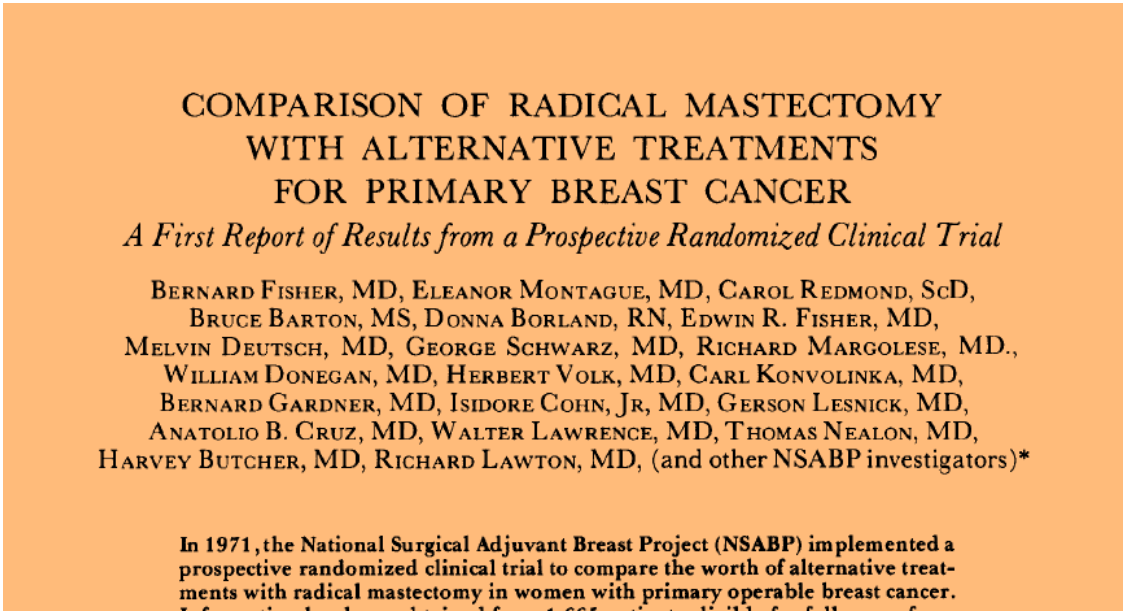
The NSABP was one of the first organizations to undertake large-scale studies in the prevention of breast cancer, and our Breast Cancer Prevention Trial (BCPT), which included more than 13,000 women at increased risk for breast cancer, demonstrated the value of the drug tamoxifen in reducing the incidence of the disease in this population. The second prevention trial, the Study of Tamoxifen and Raloxifene (STAR) entered more than 19,000 women to compare the effects of these two drugs in reducing the incidence of breast cancer.

The Office of the Chairman and the NSABP Operations Center are located on the campus of Allegheny General Hospital, and the group's Biostatistical Center is at the University of Pittsburgh. In addition to federally sponsored studies, the NSABP also conducts research supported by other resources.



NSABP 04

- What was seen?
- For the Evaluation of Radical Mastectomy and Total Mastectomy With and Without Radiation in the Primary Treatment of Cancer of the Female Breast



COMPARISON OF RADICAL MASTECTOMY
WITH ALTERNATIVE TREATMENTS
FOR PRIMARY BREAST CANCER

A First Report of Results from a Prospective Randomized Clinical Trial

BERNARD FISHER, MD, ELEANOR MONTAGUE, MD, CAROL REDMOND, ScD,
BRUCE BARTON, MS, DONNA BORLAND, RN, EDWIN R. FISHER, MD,
MELVIN DEUTSCH, MD, GEORGE SCHWARZ, MD, RICHARD MARGOLESE, MD.,
WILLIAM DONEGAN, MD, HERBERT VOLK, MD, CARL KONVOLINKA, MD,
BERNARD GARDNER, MD, ISIDORE COHN, JR, MD, GERSON LESNICK, MD,
ANATOLIO B. CRUZ, MD, WALTER LAWRENCE, MD, THOMAS NEALON, MD,
HARVEY BUTCHER, MD, RICHARD LAWTON, MD, (and other NSABP investigators)*

In 1971, the National Surgical Adjuvant Breast Project (NSABP) implemented a prospective randomized clinical trial to compare the worth of alternative treatments with radical mastectomy in women with primary operable breast cancer.

NSABP B-04

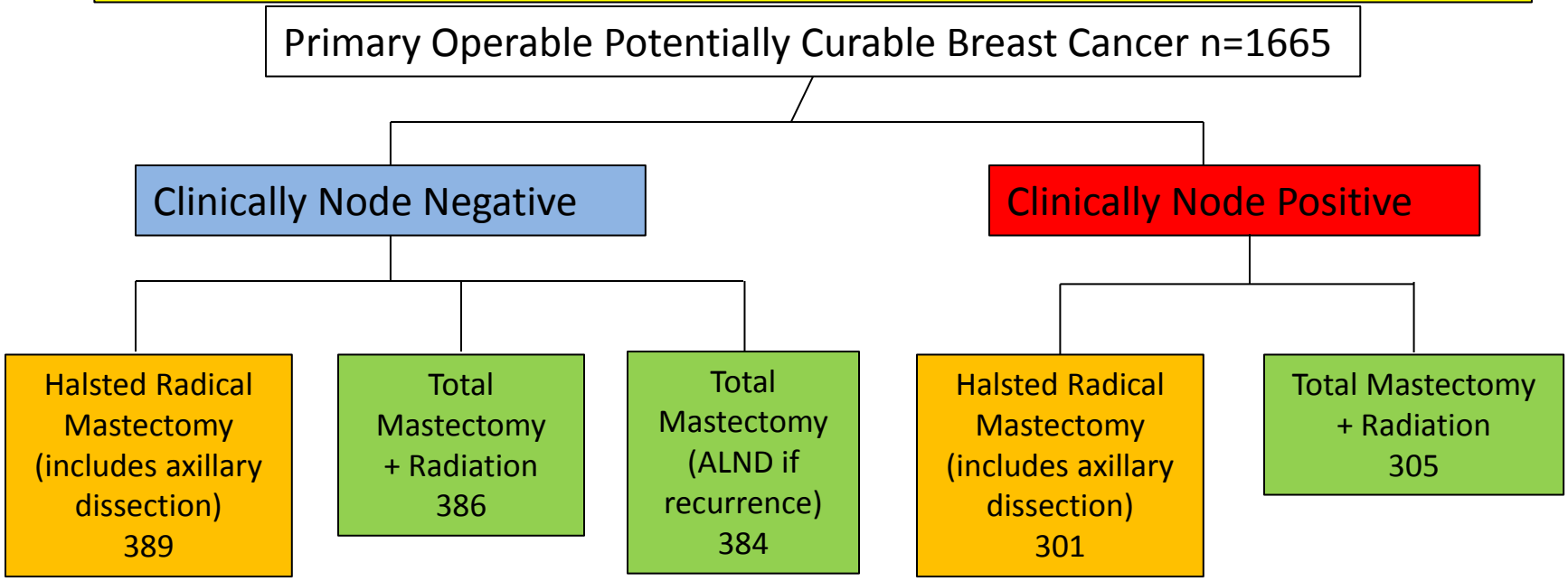
Primary Operable Potentially Curable Breast Cancer n=1665

- Clinically Node Negative
  - Halsted Radical Mastectomy (includes axillary dissection) 389
  - Total Mastectomy + Radiation 386
  - Total Mastectomy (ALND if recurrence) 384
- Clinically Node Positive
  - Halsted Radical Mastectomy (includes axillary dissection) 301
  - Total Mastectomy + Radiation 305

No Systemic Adjuvant Therapy (1971-1974)

Fisher, et al. Cancer 1977;39:2827-2839

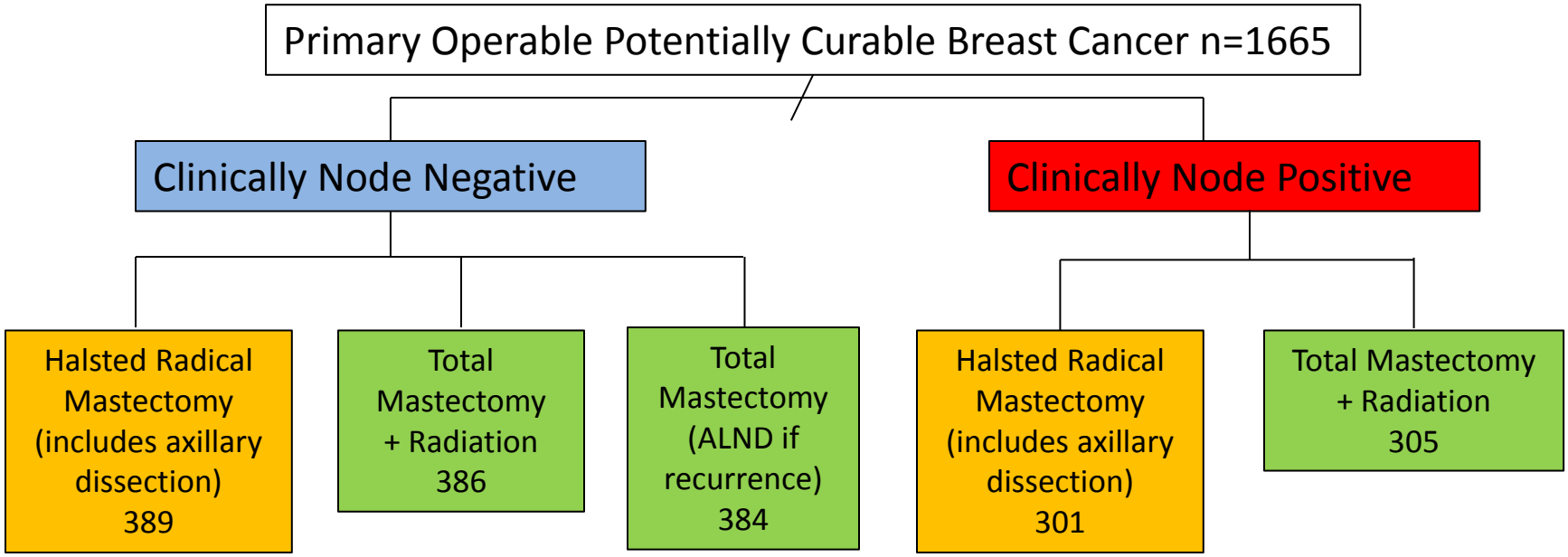
In the **node-positive** arm, the LRR rates were not significantly different: 16% in patients who underwent radical mastectomy versus 14% in patients who underwent total mastectomy plus radiation (p=0.67).



Fisher, et al. Cancer 1977;39:2827-2839

NSABP B-04

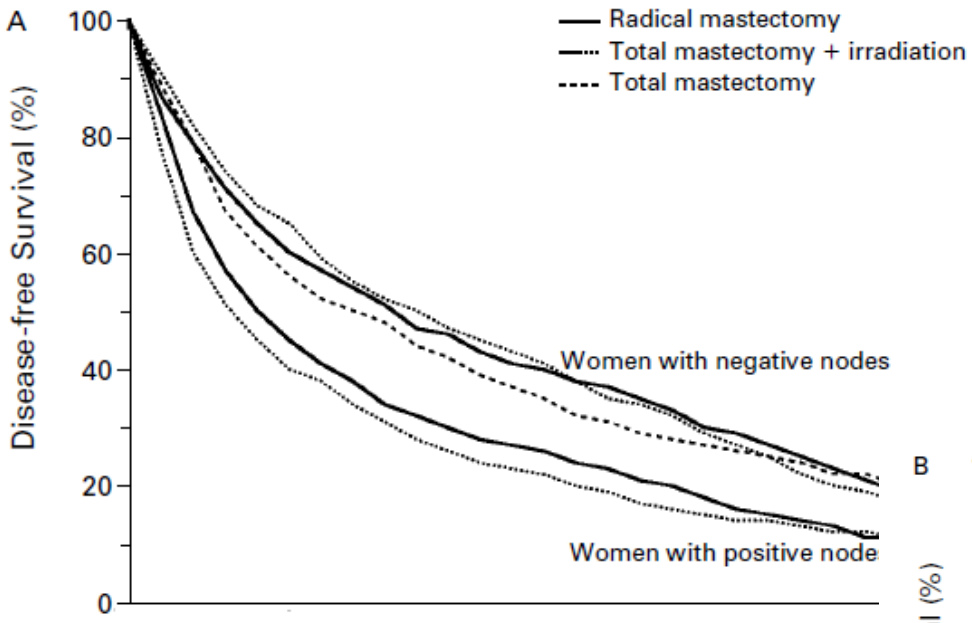
In the **node negative** arm, patients who underwent **total mastectomy plus radiation** had **a lower** rate of local-regional recurrence (LRR; 5%) than did those who underwent radical mastectomy (9%) or total mastectomy alone (13%) (p=0.002).

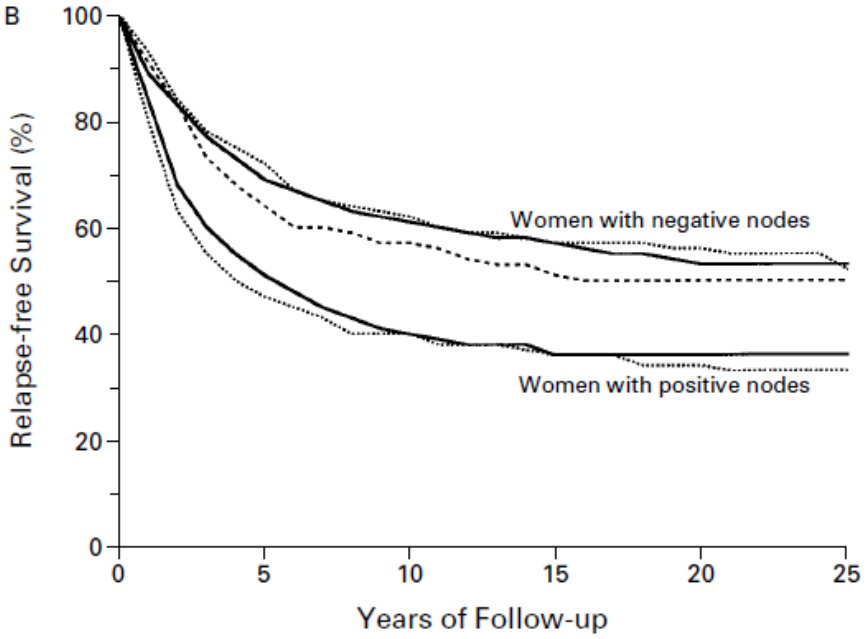


Fisher, et al. Cancer 1977;39:2827-2839

NSABP B-04

NSABP 04 at 2002(25 years FU)





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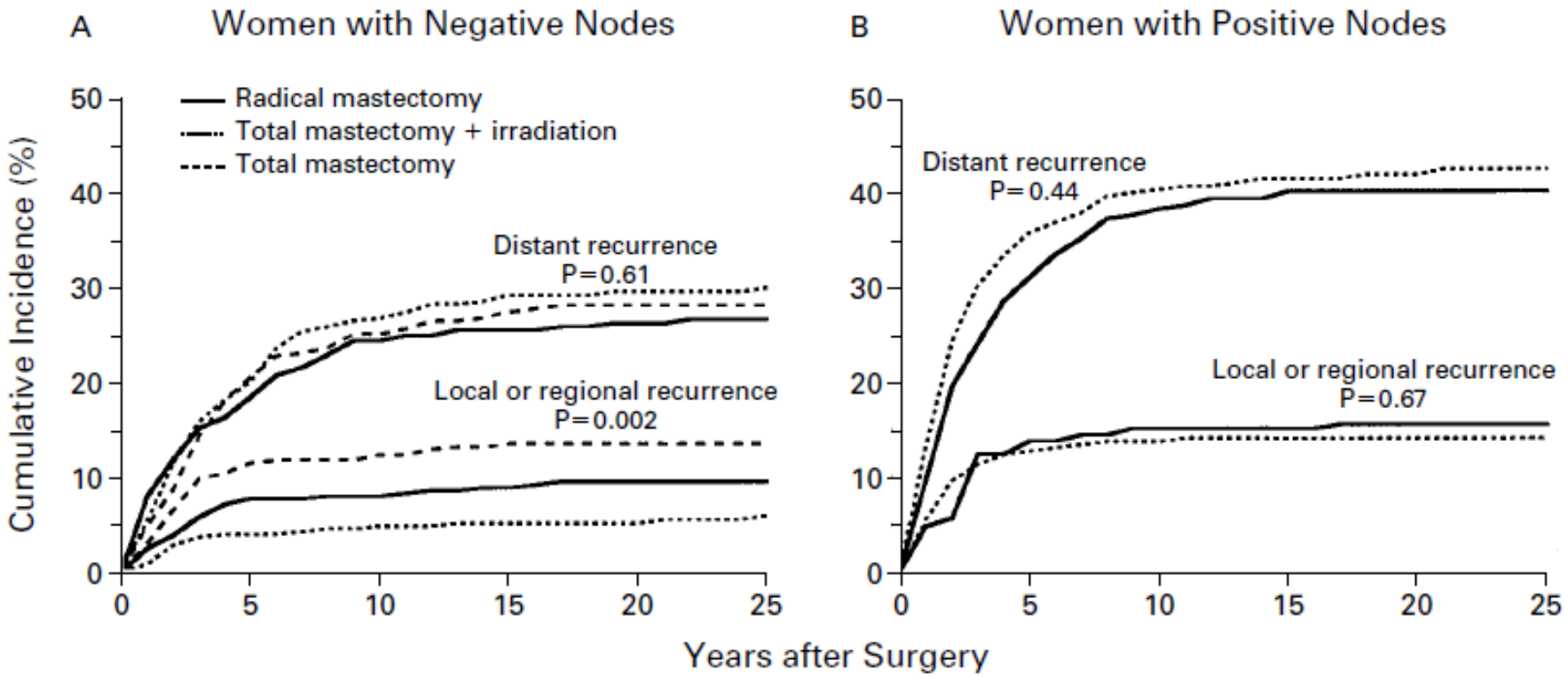


These findings fail to confer a significant survival advantage from removing occult positive nodes at the time of initial surgery or from the addition of loco-regional radiation to total mastectomy.

NSABP B-06

Clinical tumor size <4.0 cm, LN+/-
(N=2163)

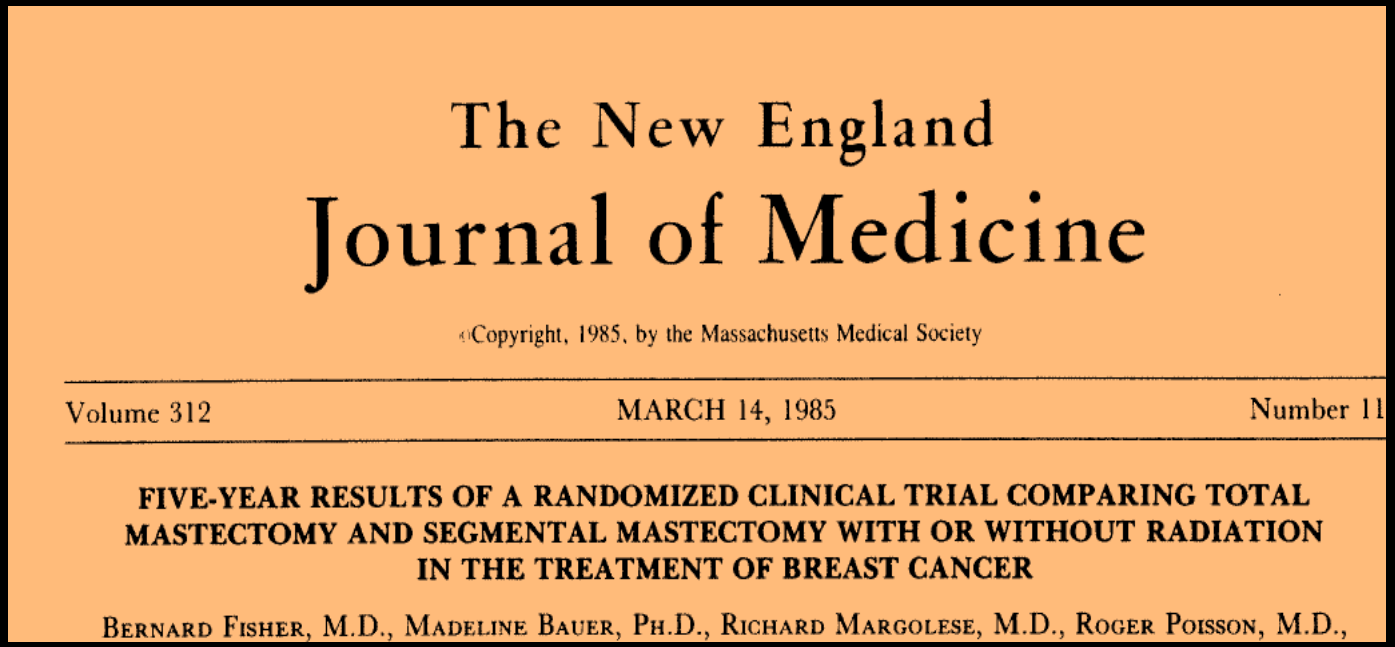
Mastectomy + Axillary dissection (Radical Mastectomy)	Lumpectomy + Axillary dissection	Lumpectomy + Axillary dissection + XRT

N+ : Melphalan and 5-FU (1976-1984)
Mastectomy if lumpectomy margins positive
Negative margins = “no ink on tumor”

Fisher, et al. New Engl J Med 2002;347:1233-41

NSABP 06

- OBJECTIVE : To find whether LUMPECTOMY &
- AXILLARY DISSECTION with or without RADIOTHERAPY is better than TOTAL MASTECTOMY with AXILLARY DISSECTION in early stage breast cancer (stage I & II with tumour size < 4 cm,N0/N1)



The New England
Journal of Medicine

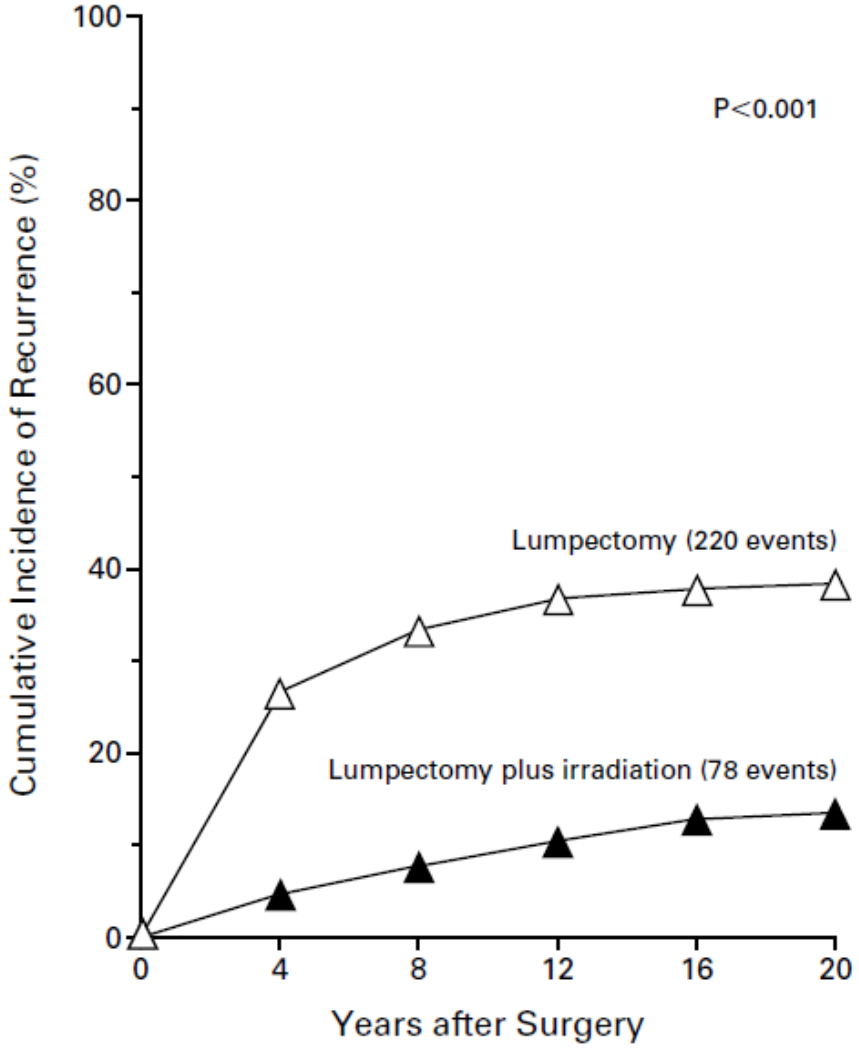
Volume 312 MARCH 14, 1985 Number 11

FIVE-YEAR RESULTS OF A RANDOMIZED CLINICAL TRIAL COMPARING TOTAL MASTECTOMY AND SEGMENTAL MASTECTOMY WITH OR WITHOUT RADIATION IN THE TREATMENT OF BREAST CANCER

BERNARD FISHER, M.D., MADELINE BAUER, PH.D., RICHARD MARGOLESE, M.D., ROGER POISSON, M.D.,

NSABP 06

- The cumulative incidence of a recurrence in the ipsilateral breast 20 years after surgery was 14.3 percent among the women who underwent irradiation after lumpectomy and 39.2 percent among those who underwent lumpectomy without irradiation (P<0.001)
- The benefit of radiation therapy was independent of the nodal status
- Patients who received radiation had fewer late recurrences; 73% of recurrences in the lumpectomy plus radiation group werewithin 5 years while 9% occurred after 10 years compared to the lumpectomy-only group in which 40% of the recurrences were within 5 years and 30% occurred after 10 year



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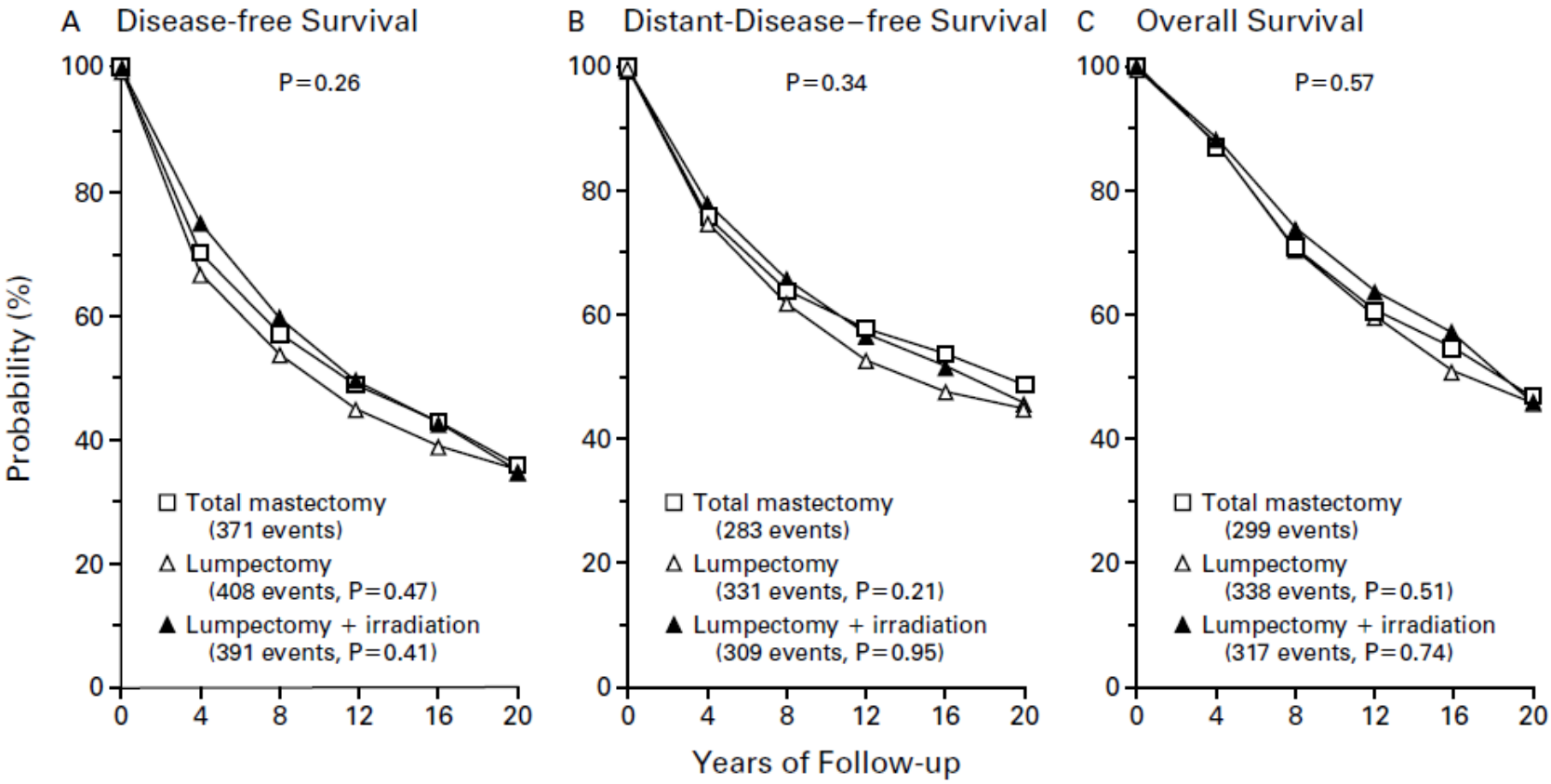
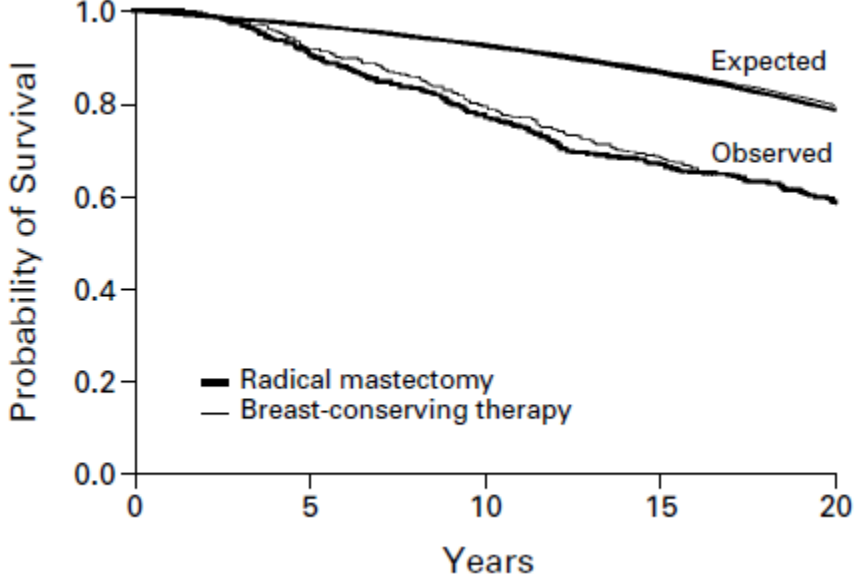
- No significant differences in DFS, DDFS, or OS among groups





MILAN TRIAL

The New England Journal of Medicine

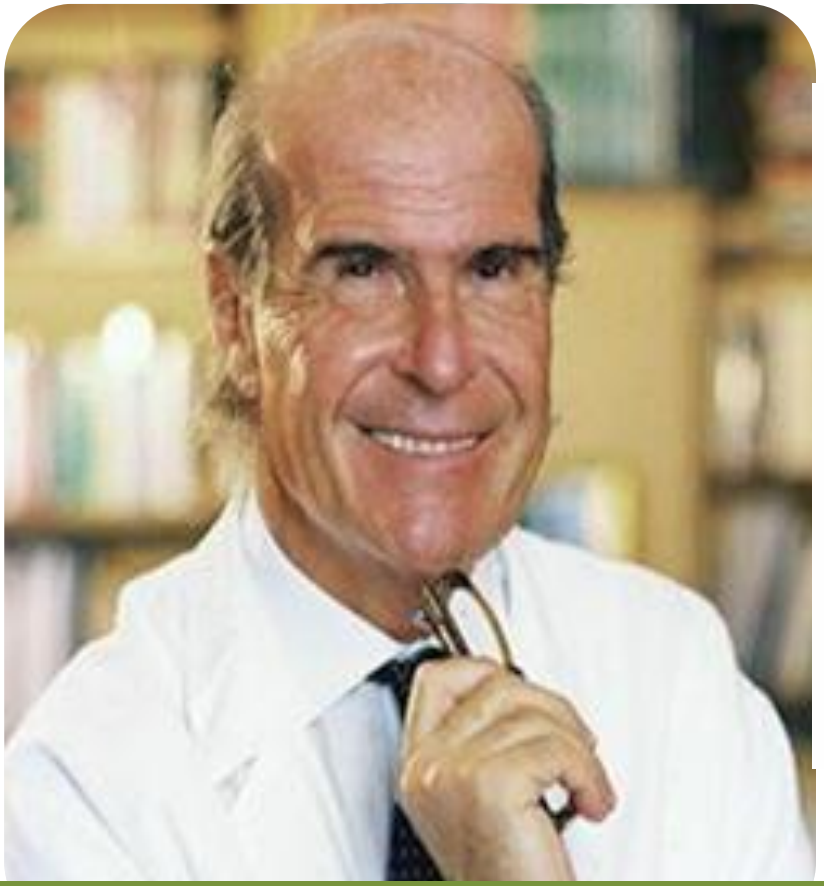
VOLUME 347 OCTOBER 17, 2002 NUMBER 1

TWENTY-YEAR FOLLOW-UP OF A RANDOMIZED STUDY COMPARING BREAST-CONSERVING SURGERY WITH RADICAL MASTECTOMY FOR EARLY BREAST CANCER

UMBERTO VERONESI, M.D., NATALE CASCINELLI, M.D., LUIGI MARIANI, M.D., MARCO GRECO, M.D., ROBERTO SACCOZZI, M.D., ALBERTO LUINI, M.D., MARISEL AGUILAR, M.D., AND ETTORE MARUBINI, PH.D.

- After a median follow-up of 20 years, the rate of death from all causes was 41.7 percent in the group that underwent breast-conserving surgery and 41.2 percent in the radical-mastectomy group (P=1.0). The respective rates of death from breast cancer were 26.1 percent and 24.3 percent (P=0.8).

The new “Gods” in Breast cancer



“In God we trust..all others must have data”

In the last century, we have committed to evidence-based medicine, but in the new millennium, we need to restore humanity.

Oncoplastic Breast Surgery

- Goals

✓ **Complete removal of tumor**

✓ **Negative margin**

✓ **Good to excellent cosmetic outcome**

✓ **Single stage Surgery**

Which patient are offered Oncoplastic Sx

Patient selection
1. Those who wish to undergo partial reconstruction
2. Those who don't want replacement techniques
3. Those who wish to reduct their breasts
4. Those in whom cancer is confirmed preoperatively
5. Breast size: moderate to large
6. Defect size: moderate to large

Oncoplastic breast surgery

- **Volume Displacement**
- **Displacing local tissue**

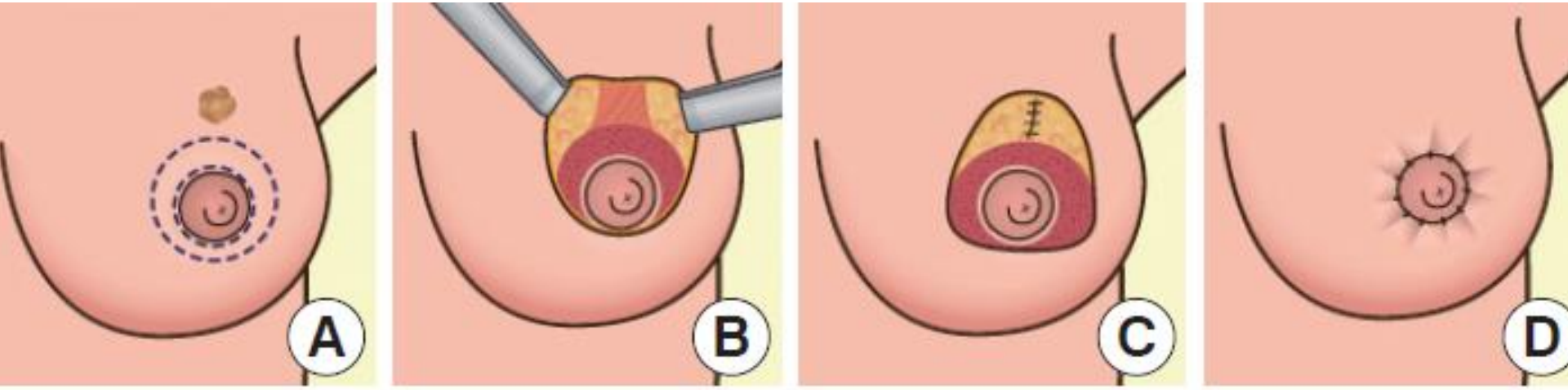
	LEVEL I	LEVEL II
Volume excised	Upto 20%	20-50%
Skin excision	Not required	Required for breast reshaping
mammography	Dense breast	Fatty breast
Plastic surgery techniques	Not required	required

Volume replacement

use of autologous tissue for volume replacement usually as flaps

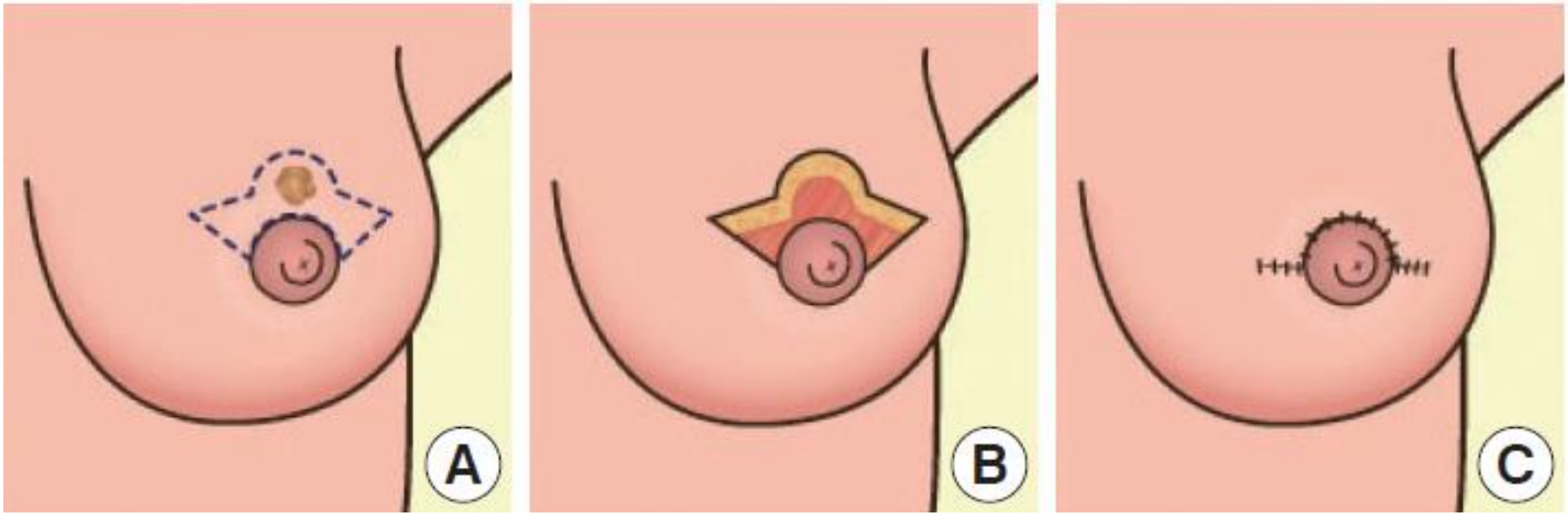
Glandular Re Shaping

Round Block technique



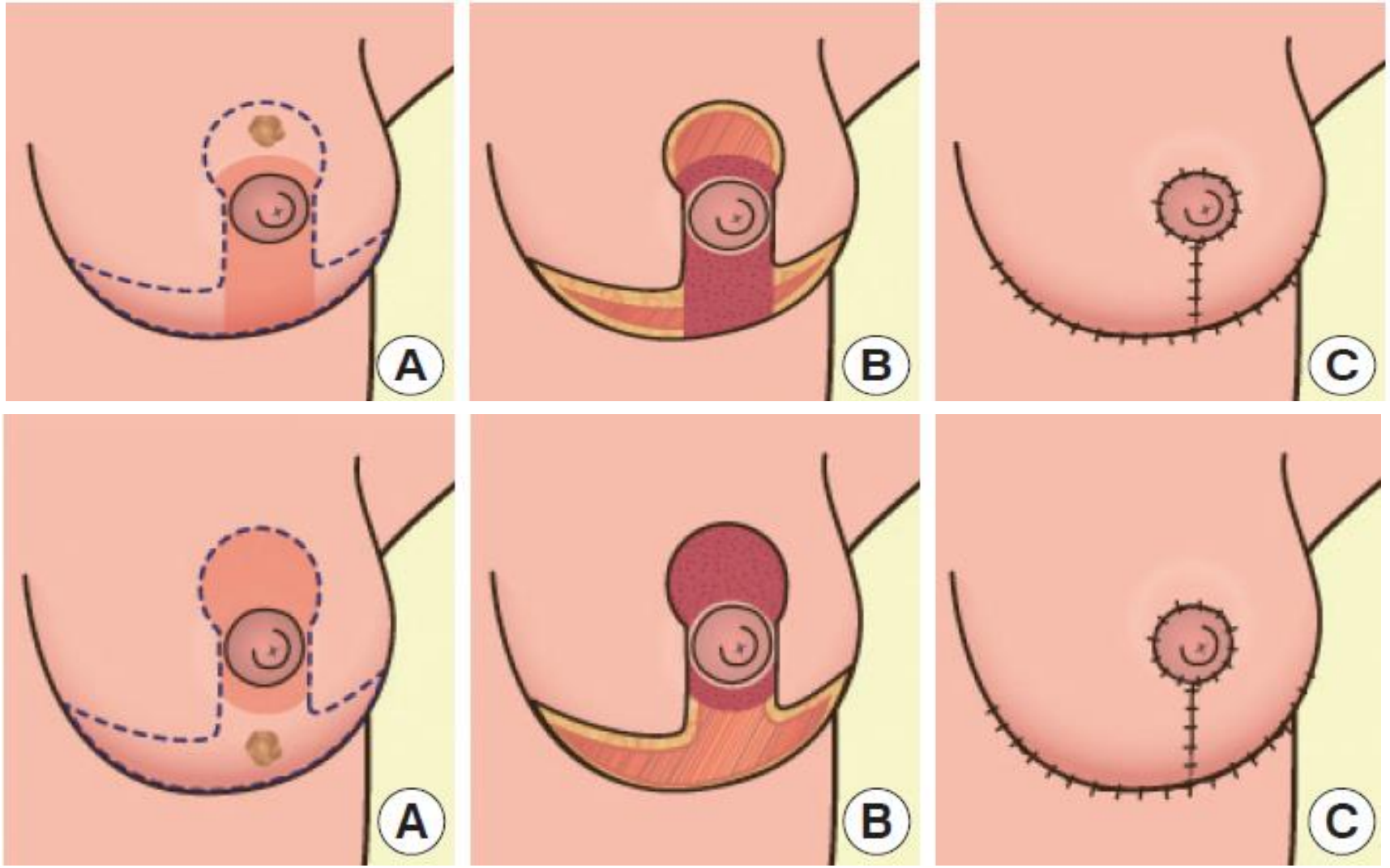
Glandular Re Shaping

Batwing mastopexy

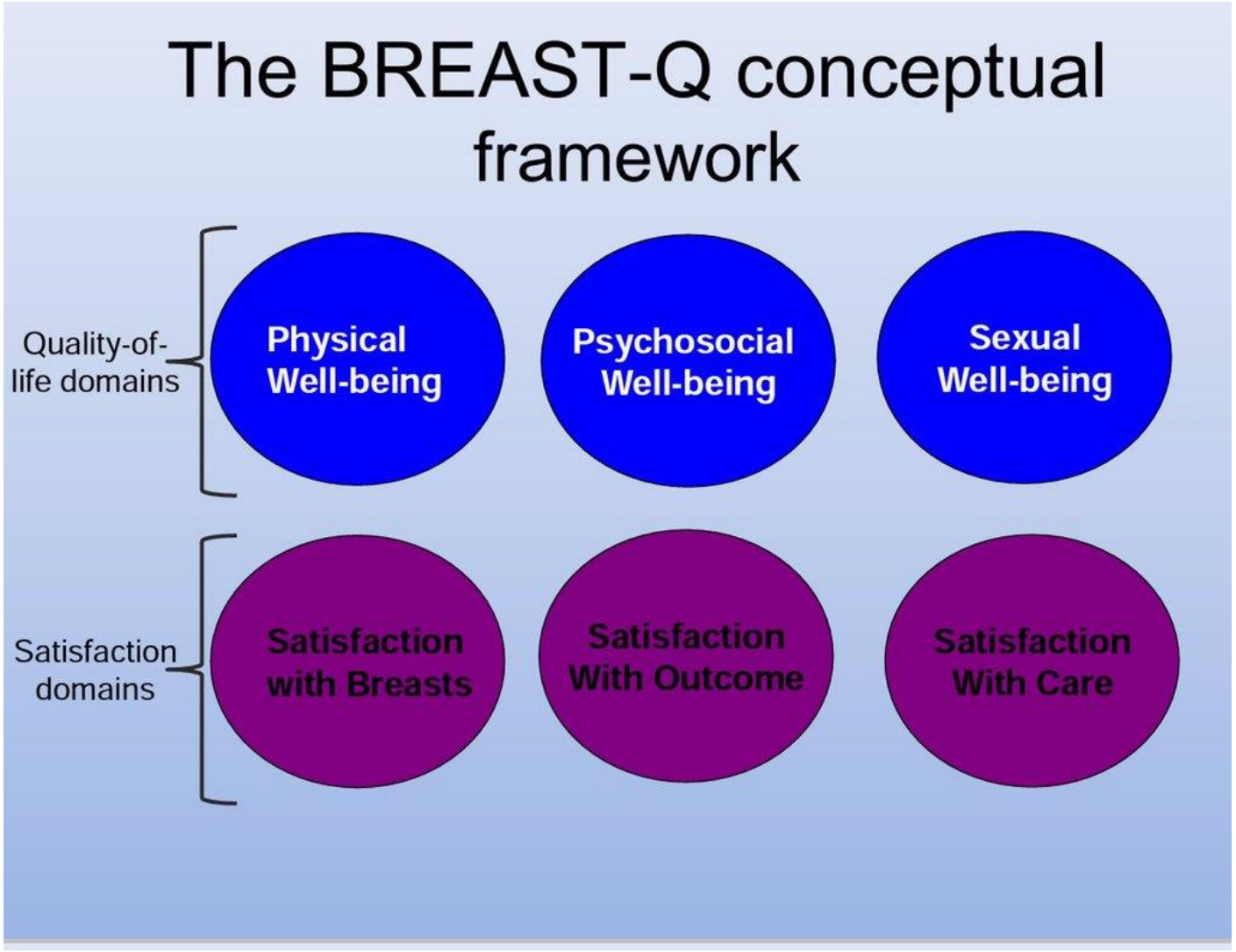


Reduction mammoplasty

Wise Pattern type



Is your patient Satisfied?



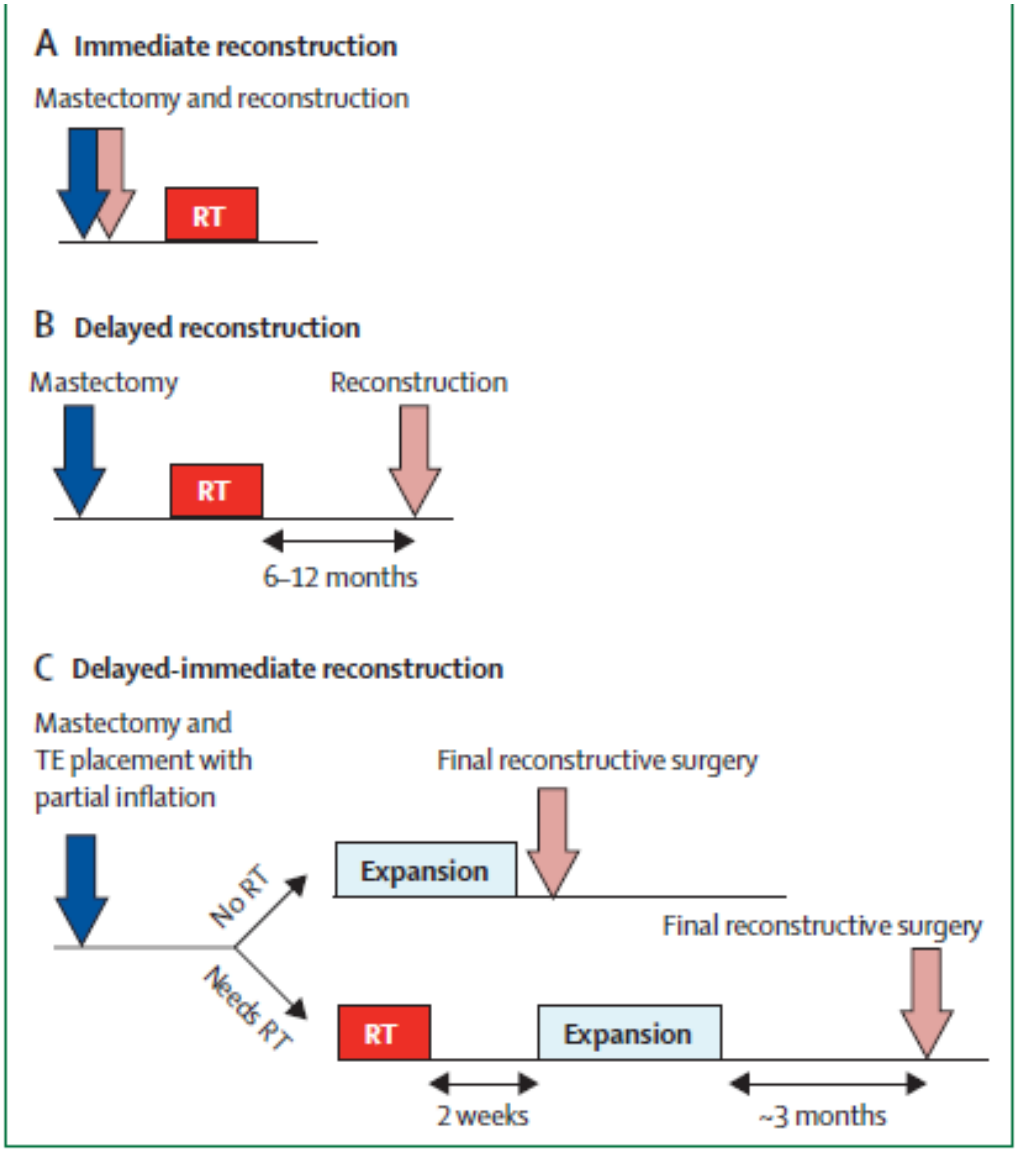
Breast Reconstruction

- Types
- Timing
- Effect of Radiation

Breast reconstruction

- Implant based
- Tissue based
- Pedicle flaps(local: LD flap)
- Pedicle flaps (Distant: TRAM flap)
- Free flap (DIEP flaps)

Timing


A Immediate reconstruction
Mastectomy and reconstruction
RT
B Delayed reconstruction
Mastectomy
Reconstruction
RT
6–12 months
C Delayed-immediate reconstruction
Mastectomy and
TE placement with
partial inflation
Final reconstructive surgery
Expansion
No RT
Needs RT
Final reconstructive surgery
RT
Expansion
2 weeks
~3 months

Effect of Radiation on Breast reconstruction

- Needs meticulous planning
- Tangential beam with implants
- Proton therapy is upcoming technology
- Enlistment in clinical trials

Axilla..Surgeon & You.

Definations

- Axillary clearance
- Axillary Dissection
- Axillary sampling
- Sentinel Node Biopsy
- Reverse Axillary mapping

Indication of ALND

S+T Node Positive Axillary Disease in Breast cancer

- S+T Positive Sentinel Node biopsy(>2 nodes)
- T Axillary recurrence in Post sentinel/Ax.RT
- S+T Occult Breast Cancer with Only Nodal Dis.

- Melanoma Limb/Back/Chest wall
- SCC chest wall/Limb

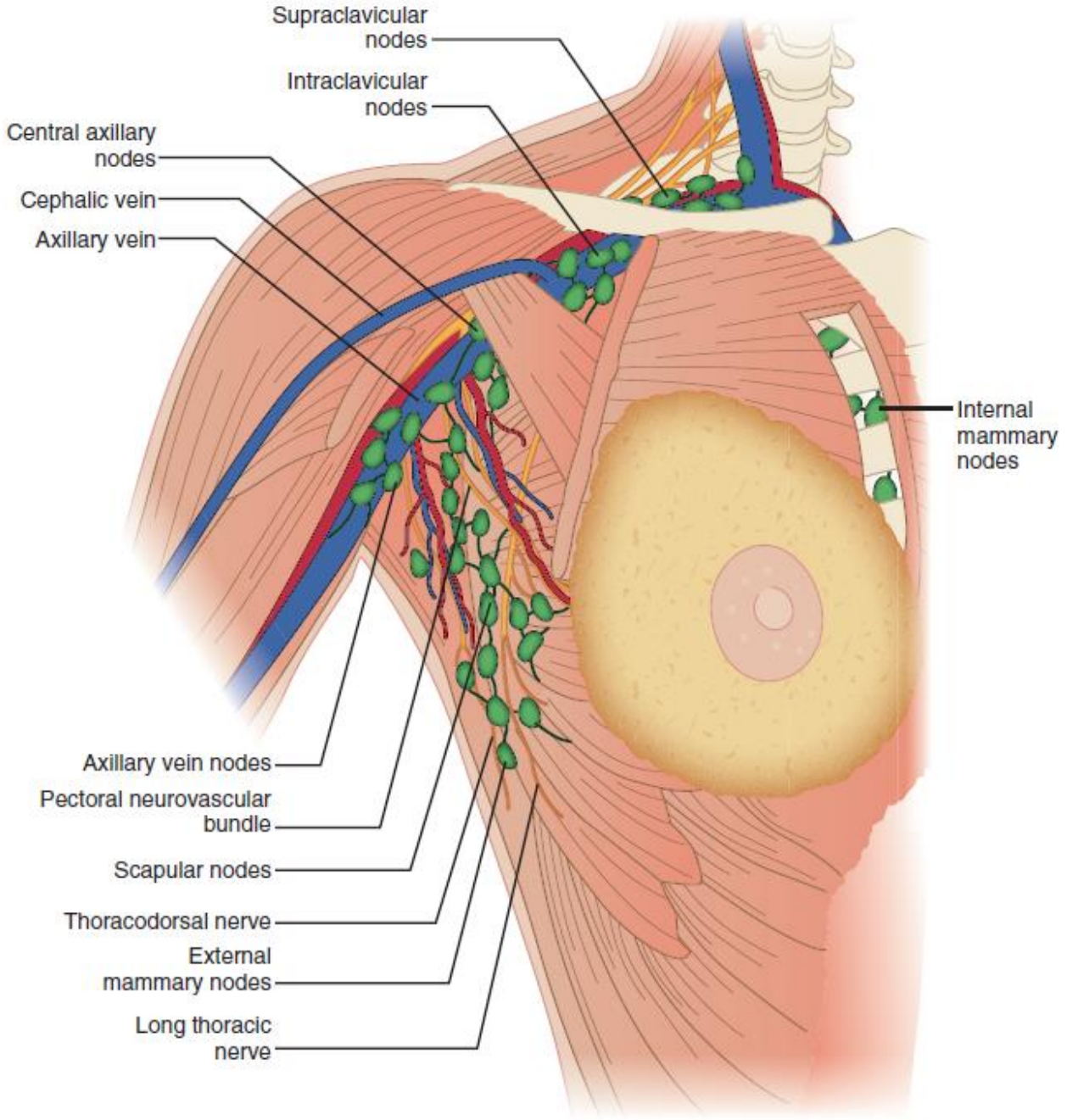
S STAGING

T THERAPEUTIC

Contraindications

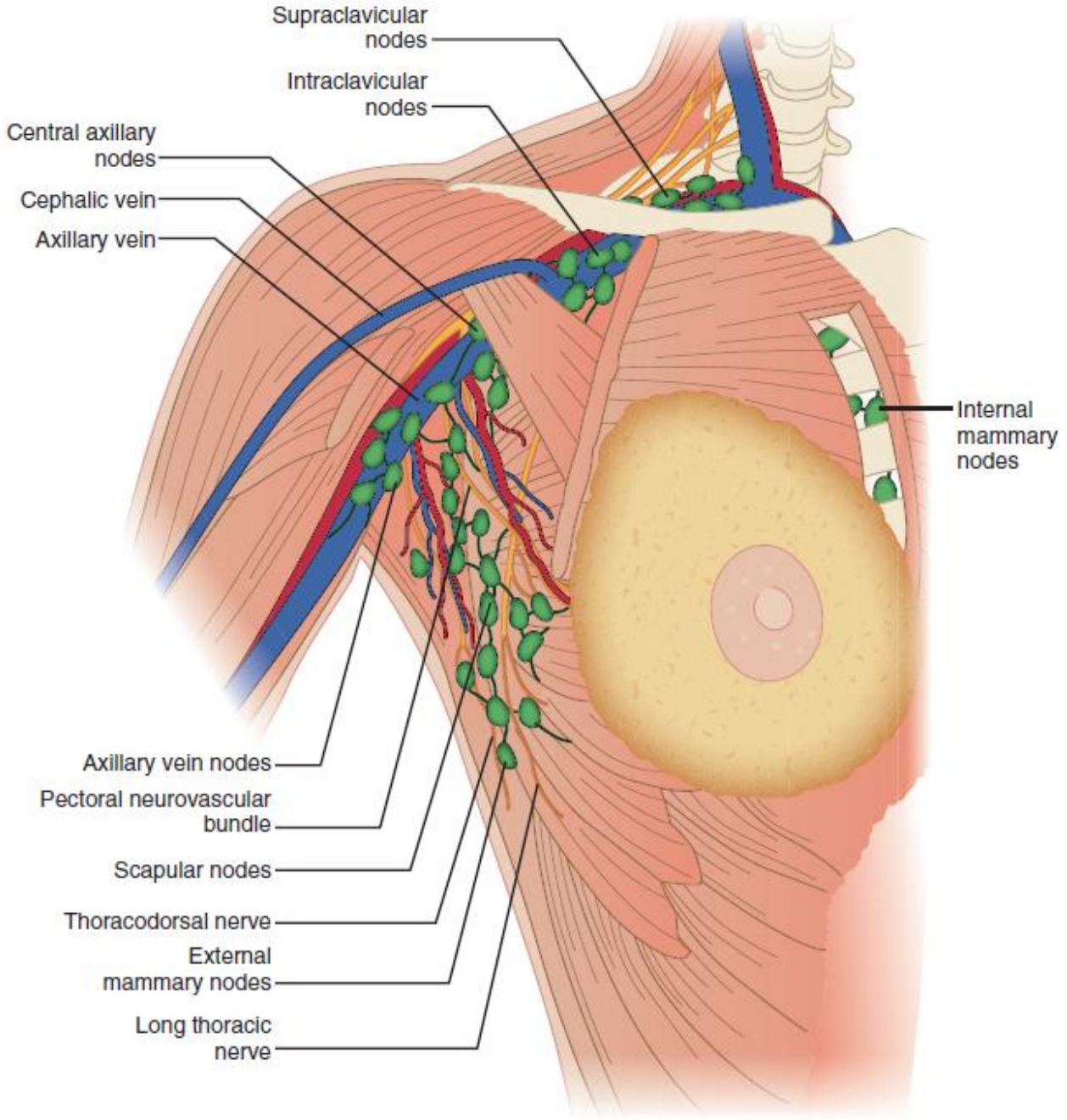
- EARLY breast cancer with Node negative axilla (sentinel Node Biopsy facility available)
- Palliative mastectomy “Toilet Mastectomy”
- Past H/O axillary radiation or past ALND

- Patient NOT giving Consent for procedure.



Level I

Superiorly: Ax vein
Laterally : Latt dorsi
Medially : Pect minor



Level II

Superiorly: Ax vein
Laterally : Pect Minor
Medially : Pect minor

Definations

- Axillary clearance
- Axillary Dissection
- Axillary sampling
- Sentinel Node Biopsy
- Reverse Axillary mapping

Indication of ALND

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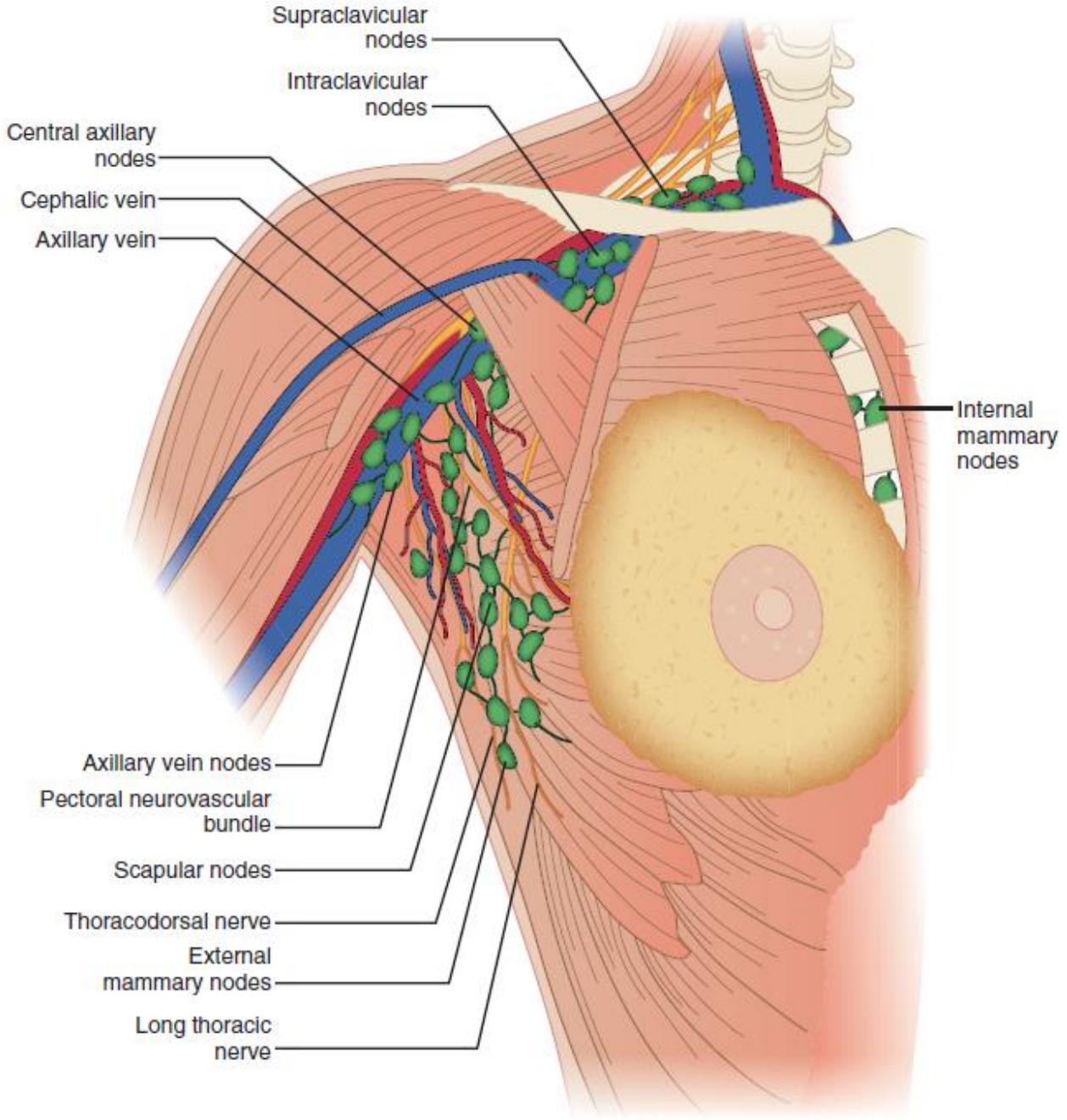

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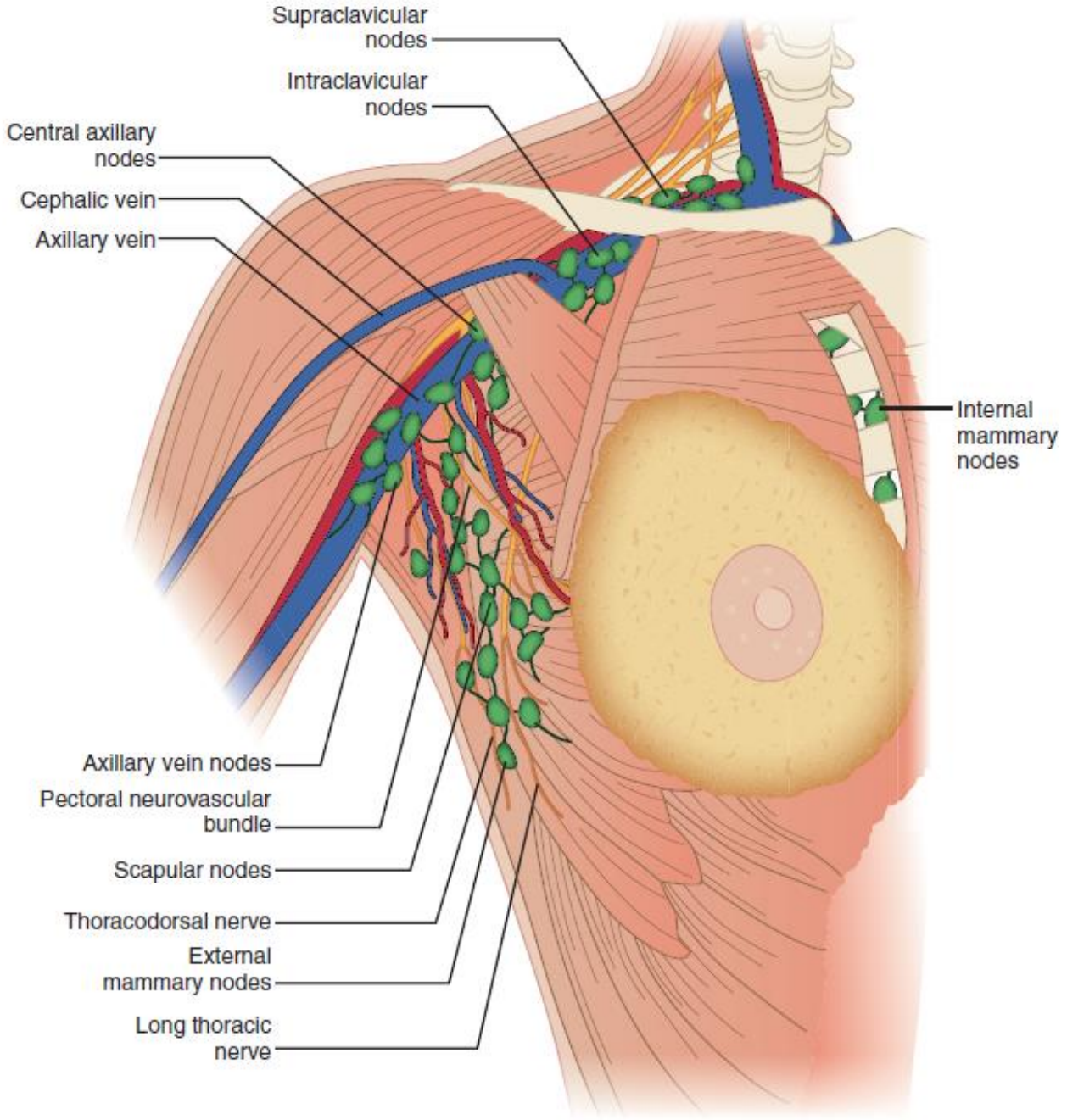


Level II

Superiorly: Ax vein
Laterally : Pect Minor
Medially : Pect minor

Complications

- **IntraOperative**
- ✓ Vascular injury
- ✓ Nerve Injury

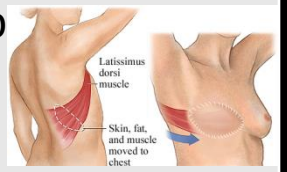
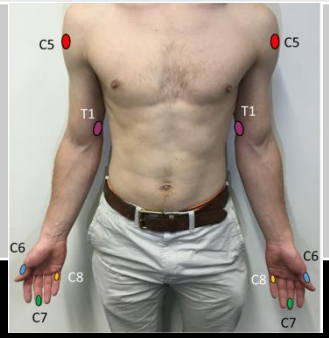
Late Post Operative

- ✓ Nerve injury
- ✓ Lymphoedema
- ✓ Recurrence

Early Post Operative

- Seroma
- Haematoma
- Frozen Shoulder
- Infections
- Flap necrosis

Nerve Injury

Nerve	Root value	Function	Manifestation	Comments
Long Thoracic Nerve	C5,6,7	Protraction of scapula Flexion Abduction	Winging of Scapula	
Thoraco dorsal	C6,7,8	Supply Lat dorsi	Weakness Adduction,Internal rotation	MUST for LD flap 
Intercostobrachial	T2 T3 T4	Sensory in medial aspect of Arm	Hypoaesthesia pain	

The era of **Sentinel**

Sentinel Lymph node Biopsy

- Concept
- When to do
- Technique
- What to do in Positive sentinel node

Sentinel Node biopsy reported

- One hundred seventy-four mapping procedures were performed using a vital dye injected at the primary breast cancer site
- Sentinel nodes were identified in 1 14 of 174 (65.5%) procedures and accurately predicted axillary nodal status in 109 of 1 14 (95.6%) cases.
- **The technique could enhance staging accuracy and, with further refinements and experience, might alter the role of ALND**.

Lymphatic Mapping and Sentinel Lymphadenectomy for Breast Cancer

Armando E. Giuliano, M.D., Daniel M. Kirgan, M.D., J. Michael Guenther, M.D., and Donald L. Morton, M.D.

From the Joyce Eisenberg Keefer Breast Center, John Wayne Cancer Institute at Saint John's Hospital and Health Center, Santa Monica, California

Objective
The authors report the feasibility and accuracy of intraoperative lymphatic mapping with sentinel lymphadenectomy in patients with breast cancer.

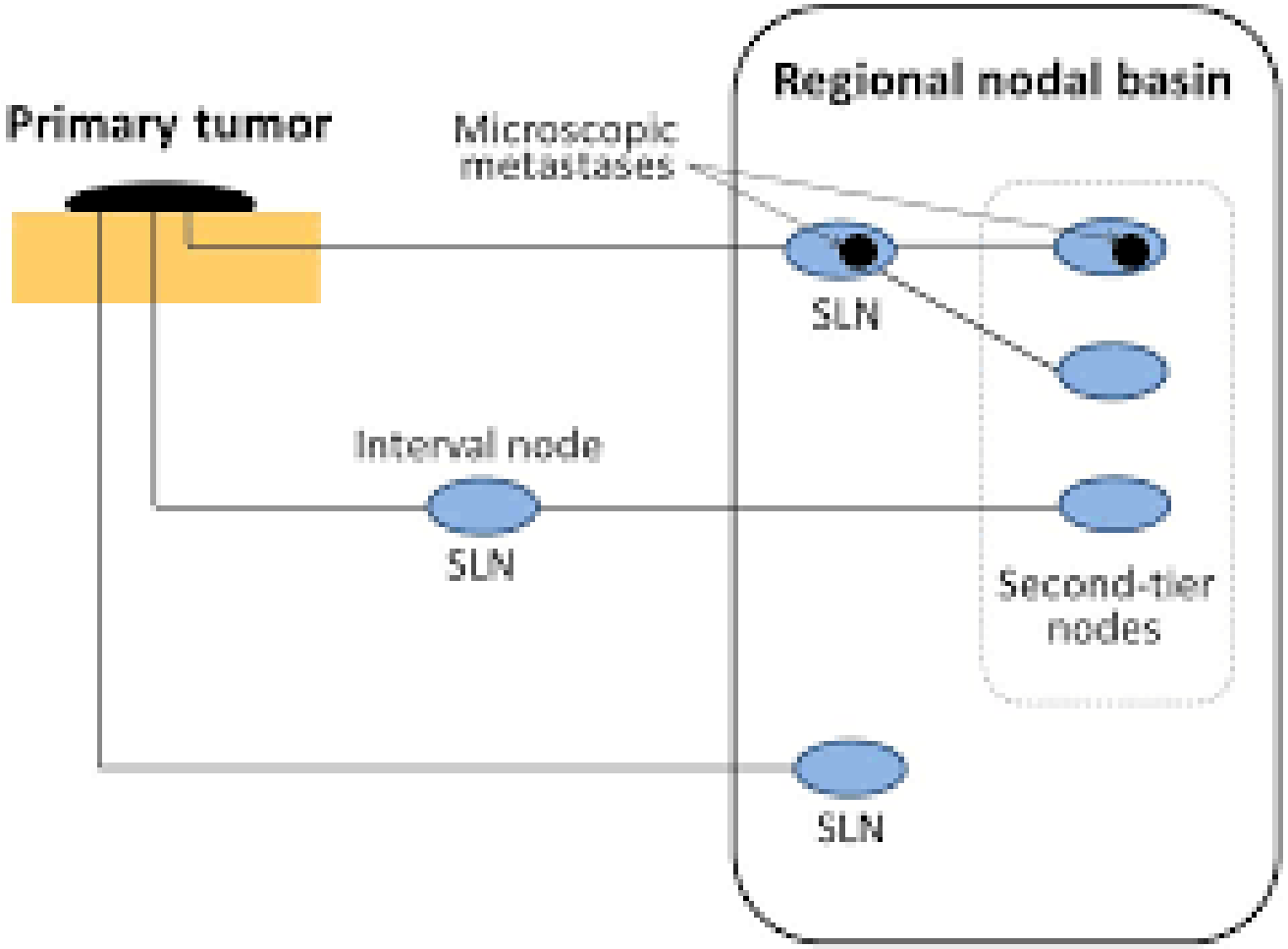
Summary Background Data
Axillary lymph node dissection (ALND) for breast cancer generally is accepted for its staging and prognostic value, but the extent of dissection remains controversial. Blind lymph node sampling or level I dissection may miss some nodal metastases, but ALND may result in lymphedema. In melanoma, intraoperative lymph node mapping with sentinel lymphadenectomy is an effective and minimally invasive alternative to ALND for identifying nodes containing metastases.

Methods
One hundred seventy-four mapping procedures were performed using a vital dye injected at the primary breast cancer site. Axillary lymphatics were identified and followed to the first (''sentinel'') node, which was selectively excised before ALND.

Results
Sentinel nodes were identified in 114 of 174 (65.5%) procedures and accurately predicted axillary nodal status in 109 of 114 (95.6%) cases. There was a definite learning curve, and all false-negative sentinel nodes occurred in the first part of the study; sentinel nodes identified in the last 87 procedures were 100% predictive. In 16 of 42 (38.0%) clinically negative/pathologically positive axillae, the sentinel node was the only tumor-involved lymph node identified. The anatomic location of the sentinel node was examined in the 54 most recent procedures; ten cases had only level II nodal metastases that could have been missed by sampling or low (level I) axillary dissection.

Conclusions
This experience indicates that intraoperative lymphatic mapping can accurately identify the sentinel node—i.e., the axillary lymph node most likely to contain breast cancer metastases—in some patients. The technique could enhance staging accuracy and, with further refinements and experience, might alter the role of ALND.

Sentinel Lymph node biopsy



Sentinel Node Biopsy

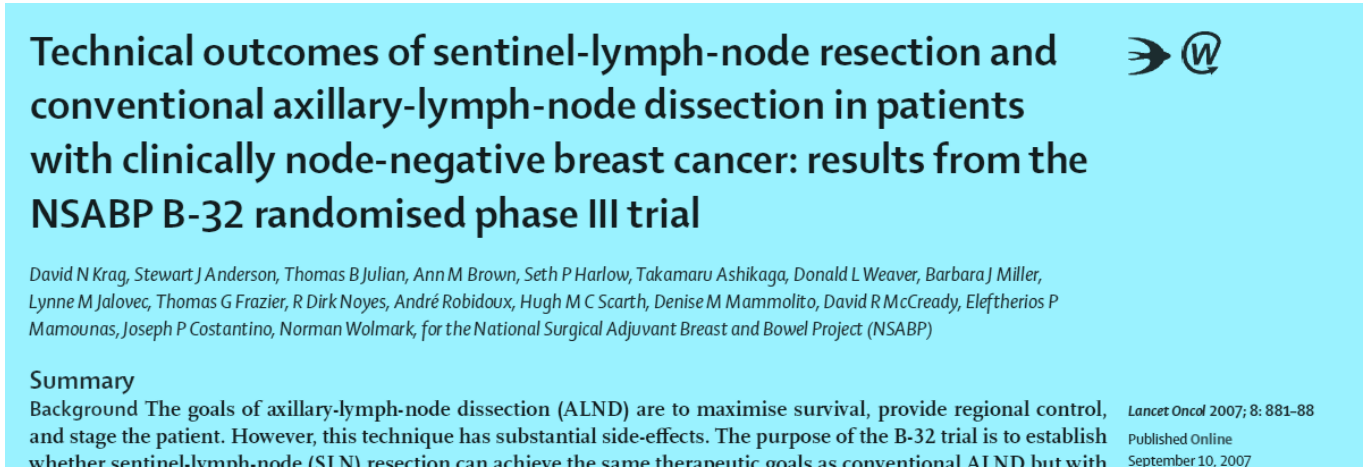
- Technique

✓ Isotope vs. Blue dye

✓ Results

NSABP 32

- **The aim of this trial is to report the technical success and accuracy of SLN resection plus ALND versus SLN resection alone**
- **5611 women with invasive breast cancer were randomly assigned to receive either SLN resection followed by immediate conventional ALND (n=2807; group 1) or SLN resection without ALND if SLNs were negative on intraoperative cytology and histological examination (n=2804; group 2) in the B-32 trial.**
- **SLNs were successfully removed in 97·2% of patients (5379 of 5536) in both groups combined. The overall accuracy of SLN resection in patients in group 1 was 97·1% (2544 of 2619; 95% CI 96·4–97·7), with a false-negative rate of 9·8% (75 of 766; 95% CI 7·8–12·2).**



Technical outcomes of sentinel-lymph-node resection and conventional axillary-lymph-node dissection in patients with clinically node-negative breast cancer: results from the NSABP B-32 randomised phase III trial

David N Krag, Stewart J Anderson, Thomas B Julian, Ann M Brown, Seth P Harlow, Takamaru Ashikaga, Donald L Weaver, Barbara J Miller, Lynne M Jalovec, Thomas G Frazier, R Dirk Noyes, André Robidoux, Hugh M C Scarth, Denise M Mammolito, David R McCready, Eleftherios P Mamounas, Joseph P Costantino, Norman Wolmark, for the National Surgical Adjuvant Breast and Bowel Project (NSABP)

Summary

Background The goals of axillary-lymph-node dissection (ALND) are to maximise survival, provide regional control, and stage the patient. However, this technique has substantial side-effects. The purpose of the B-32 trial is to establish whether sentinel-lymph-node (SLN) resection can achieve the same therapeutic goals as conventional ALND but with

Lancet Oncol 2007; 8: 881–88

Published Online September 10, 2007

Does SLNB improve QOL? The ALMANAC trial

A multicenter randomized trial to compare quality-of-life outcomes between patients with clinically node-negative invasive breast cancer who received sentinel lymph node biopsy and patients who received standard axillary treatment.

- Sentinel lymph node biopsy is associated with reduced arm morbidity and better quality of life than standard axillary treatment and should be the treatment of choice for patients who have early-stage breast cancer with clinically negative nodes.

Randomized Multicenter Trial of Sentinel Node Biopsy Versus Standard Axillary Treatment in Operable Breast Cancer: The ALMANAC Trial

Robert E. Mansel, Lesley Fallowfield, Mark Kissin, Amit Goyal, Robert G. Newcombe, J. Michael Dixon, Constantinos Yiangou, Kieran Horgan, Nigel Bundred, Ian Monypenny, David England, Mark Sibbering, Tholkifl I. Abdullah, Lester Barr, Utheshtra Chetty, Dudley H. Sinnett, Anne Fleissig, Dayalan Clarke, Peter J. Ell

Background: **Sentinel lymph node biopsy in women with**

has been axillary lymph node dissection. This a
considerable resources and causes both acute a

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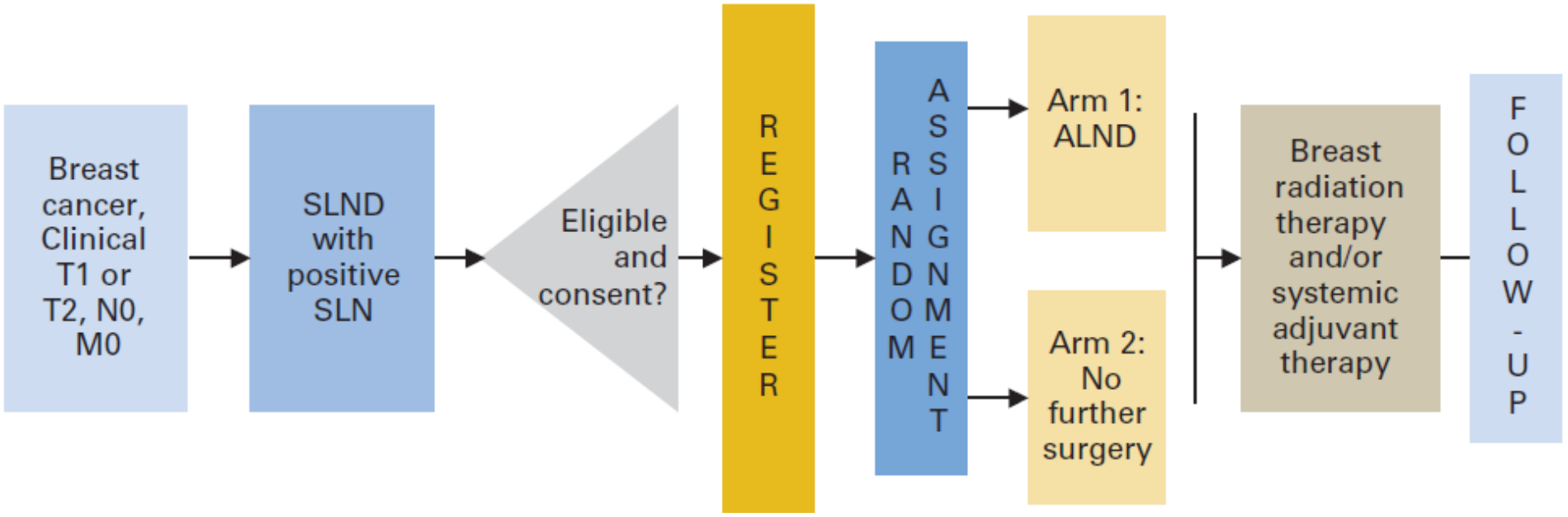
ORIGINAL REPORT

Node Dissection (SLND) Plus Axillary Lymph Node Dissection Compared With SLND Alone in the American College of Surgeons Oncology Group Trial Z0011

- Multicenter trial comparing overall survival between patients with positive sentinel lymph nodes(SLNs) who did and did not undergo axillary lymph node dissection (ALND).

Z 0011 trial



clinical T1 or T2, N0, M0 breast cancer who underwent BCT and were found to have one or two positive SLNs by H&E evaluation

All patients received
WBI (third-field axillary irradiation was not allowed), and recommendations for systemic adjuvant therapy

ACOSOZ 0011 Results

- Premature closure 891 (target 1900)
- After a median follow-up of 6.3 years, only 29 local-regional recurrences were reported in the entire population. The local recurrence rate was 2% in the SLND arm and 4% in the ALND arm. Ipsilateral axillary recurrences were uncommon, occurring in 4 (0.9%) patients in the SLND arm and 2 (0.5%) patients in the ALND arm.The authors found no differences in DFS or OS between the two groups.On the basis of these results, the ACOSOG investigators **concluded that routine use of ALND is not justified and may be safely omitted in selected patients with clinically node-negative disease who have one or two positive SLNs**

Criticism

- Significant concern was that the planned sample size was not reached.
- One reason for early closure was that the increased acceptance of screening mammography and improvements in systemic therapy led to an event rate that was lower than anticipated at the time of study design.
- The study was designed to demonstrate the non-inferiority of SLND alone for OS with a p value of 0.008. Because the 95% CIs for the HR did not cross the predefined point at which the treatments would not be considered equal, the results would not be expected to change with a larger sample size.
- The endpoints of total local-regional recurrences, DFS, and OS all numerically favored the SLN group

ACSOG Guidelines for Management of Sentinel Lymph Node

• **BIOPST RESULTS**	• **GUIDELINES**
• Negative sentinel node	• No further axillary treatment,ALND may be omitted
• Positive lymph node at presentation(proven by fnac/core needle biopsy)	• ALND should be performed
• 1 0r 2 positive Nodes	• ALND may be ommitted if – 1.primary tumour < 5cm 2.clinically negative axilla 3.will receive whole breast radiation and likely systemic theraphy
• 3 or more nodes	ALND should be performed

Post ALND lymphedema
Is it necessary to do a ALND after positive sentinel node?

The **AMAROS** trial

- To investigate whether axillary radiotherapy (ART) in patients with primary breast cancer and a tumour-positive sentinel node results in a similar axillary tumour recurrence rate compared with axillary lymph node dissection (ALND), and whether ART results in lower morbidity.

Radiotherapy or surgery of the axilla after a positive sentinel node in breast cancer (EORTC 10981-22023 AMAROS): a randomised, multicentre, open-label, phase 3 non-inferiority trial

Mila Donker, Geertjan van Tienhoven, Marieke E Straver, Philip Meijnen, Cornelis J H van de Velde, Robert E Mansel, Luigi Cataliotti, A Helen Westenberg, Jean H G Klinkenbijl, Lorenzo Orzalesi, Willem H Bouma, Huub C J van der Mijle, Grard A P Nieuwenhuijzen, Sanne C Veltkamp, Leen Slaets, Nicole J Duez, Peter W de Graaf, Thijs van Dalen, Andreas Marinelli, Herman Rijna, Marko Snoj, Nigel J Bundred, Jos W S Merkus, Yazid Belkacemi, Patrick Petignat, Dominic A X Schinagl, Corneel Coens, Carlo G M Messina, Jan Bogaerts, Emiel J T Rutgers

Summary

Background If treatment of the axilla is indicated in patients with breast cancer who have a positive sentinel node, axillary lymph node dissection is the present standard. Although axillary lymph node dissection provides excellent regional control, it is associated with harmful side-effects. We aimed to assess whether axillary radiotherapy provides comparable regional control with fewer side-effects.

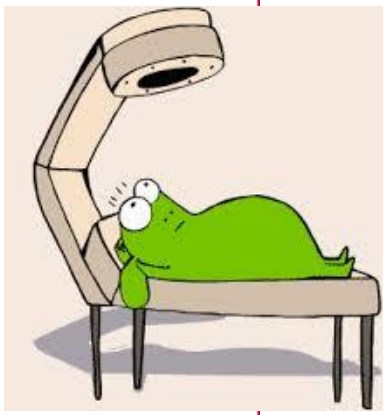
Lancet Oncol 2014; 15: 1303–10
Published Online
October 16, 2014
http://dx.doi.org/10.1016/S1470-2045(14)70460-7

The AMAROS trial

4823 patients registered

17 did not provide informed consent

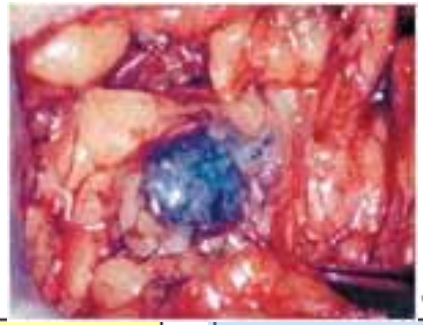
4806 randomly assigned



2402 assigned to axillary lymph node dissection

2404 assigned to axillary radiotherapy

1658 excluded
1532 sentinel node negative
62 sentinel node not identified
64 other*



1723 excluded
1599 sentinel node negative
70 sentinel node not identified
54 other*

744 sentinel-node-positive patients included in intention-to-treat analyses

681 sentinel-node-positive patients included in intention-to-treat analyses

Lymphoedema

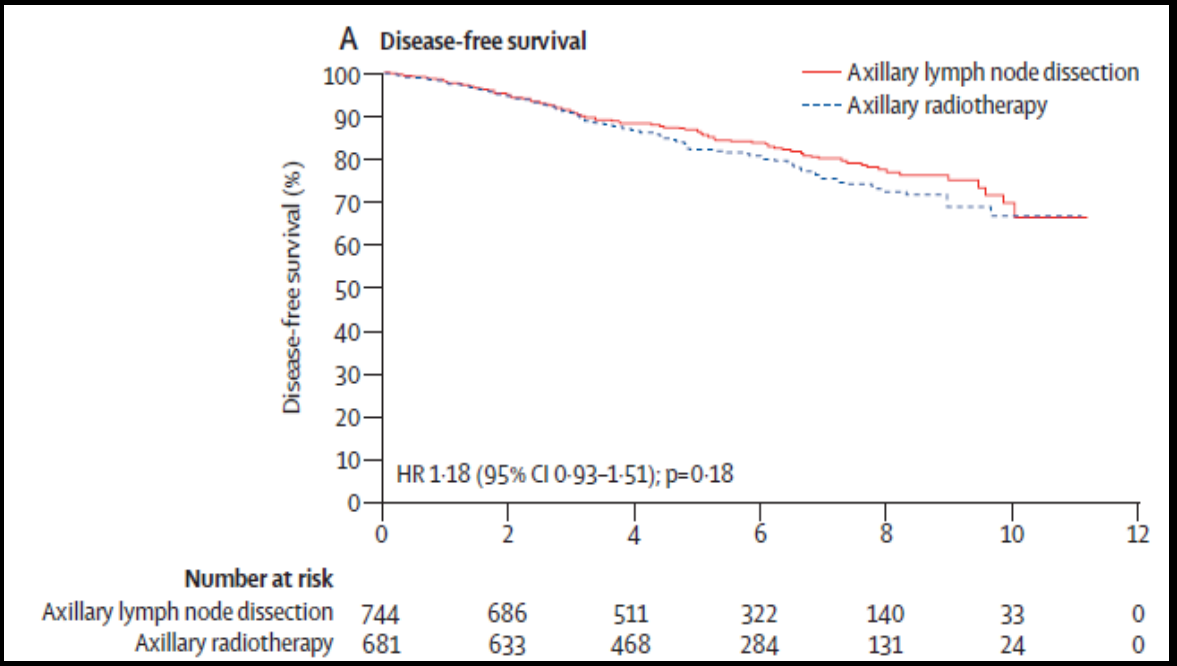
	Axillary lymph node dissection	Axillary radiotherapy	p value
Clinical sign of lymphoedema in the ipsilateral arm			
Baseline	3/655 (<1%)	0/586 (0%)	0·25
1 year	114/410 (28%)	62/410 (15%)	<0·0001
3 years	84/373 (23%)	47/341 (14%)	0·003
5 years	76/328 (23%)	31/286 (11%)	<0·0001
Arm circumference increase ≥10% of the ipsilateral upper or lower arm, or both			
Baseline	33/655 (5%)	24/586 (4%)	0·497
1 year	32/410 (8%)	24/410 (6%)	0·332
3 years	38/373 (10%)	22/341 (6%)	0·080
5 years	43/328 (13%)	16/286 (6%)	0·0009

Data are n/N (%), unless otherwise specified.

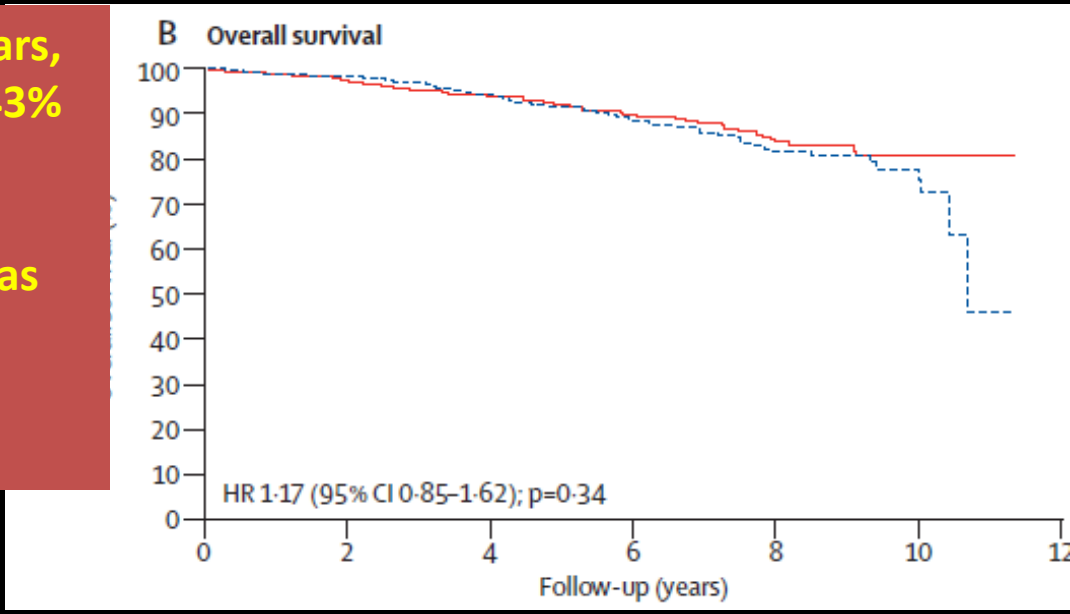
Table 2: Lymphoedema

Lymphoedema was noted significantly more often after ALND than after ART at 1 year, 3 years and 5 years. There were no significant differences in shoulder function or quality of life.

AMAROS trial



After a median follow-up period of 6.1 years, the 5-year axillary recurrence rate was 0.43% after ALND and 1.19% after ART; the difference was not statistically significant. At 5 years the disease-free survival rate was 86.9% after ALND and 82.7% after ART. Overall survival was 93.3% and 92.5% respectively.



CONCLUSION